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CHLORAMPHENICOL (CHLOROMYCETIN®) AND AUREOMYCIN IN SURGICAL INFECTIONS

William A. Altemeier, M.D.
and
William R. Culbertson, M.D., Cincinnati

Chloramphenicol (chloromycetin®) and aureomycin are two of the most promising of the newer antibiotic agents that have extended considerably the possibilities of effective chemotherapy for surgical infections. The knowledge gained from the experimental and clinical use of these two antibiotics has been sufficient to indicate the relative values and limitations of each. This discussion is intended to be a study of the antimicrobial spectrum of aureomycin and chloramphenicol, a review of current methods of administration of these two agents and an appraisal of their clinical effects in a series of patients with surgical infections treated at Cincinnati General Hospital.

ANTIMICROBIAL SPECTRUM

The range of antimicrobial activity of chloramphenicol and aureomycin in vitro is very similar, many of the gram-negative aerobic bacilli, bacteroides, gram-positive pyogenic cocci, clostridia and certain of the viruses and rickettsia being sensitive to the action of each agent. In table 1, a comparison of the antimicrobial spectrums of penicillin, chloramphenicol and aureomycin is made.

An analysis of this table reveals that aureomycin and chloramphenicol possess marked antibacterial activity for the various gram-positive pyogenic cocci, which is, however, less than that of penicillin. Penicillin is approximately 33 to 166 times more antibacterial than chloramphenicol for the hemolytic Staphylococcus aureus and from 2 to 330 times more than aureomycin, the degree depending on the susceptibility of the different strains.

On the other hand, aureomycin and chloramphenicol have a much greater antibacterial action on gram-negative bacteria than does penicillin. It is difficult to compare the bacteriostatic powers of aureomycin and chloramphenicol for the gram-negative bacilli, but, in general, Escherichia coli, Aerobacter aerogenes, the Proteus group, Salmonella typhosa and Alkaligenes faecalis are sensitive to the action of these two agents. However, chloramphenicol was definitely more effective against most strains of Pseudomonas aeruginosa and B. proteus than was aureomycin. For Clostridium perfringens (welchii), penicillin was most active and the effect of aureomycin was slightly greater than that of chloramphenicol.

MATERIAL

The present study is based on (1) laboratory and clinical observations made on a group of 233 patients with various types of surgical infections, who have been treated with either chloramphenicol or aureomycin at Cincinnati General Hospital since March 1949, and (2) an experimental investigation of gas gangrene.[1]

Whenever possible, the etiological agents were determined and their susceptibility to penicillin, chloramphenicol and aureomycin was measured both at the start of treatment and at intervals of three to 10 days during therapy. Each case was observed for any beneficial effect on the course of the infection or any toxic manifestation that might be attributable to the antibiotic given. Emphasis was placed on a study of the effect of these agents on patients with mixed gram-negative and gram-positive bacterial infections because of the usual resistance of this type of infection to other forms of chemotherapy.

One hundred and seventy-nine patients were treated with chloramphenicol, and 54 others received aureomycin. The smaller number of aureomycin-treated patients resulted from the fact that that antibiotic was made available to us at a later date than chloramphenicol. The patients treated with chloramphenicol consisted of 37 with staphylococcic infections, 5 with aerobic Streptococcus infections, 3 with anaerobic Streptococcus infections, 18 with gram-negative bacillary lesions, 87 with mixed gram-negative and gram-positive bacterial infection and 29 with miscellaneous diseases, including lymphogranulomatosis, venereal lymphogranuloma, blastomycosis and injected carcinoma. Eighty-seven were male, and 92 were female. The average age was 44 years, the youngest being 15 and the oldest 80. The average duration of treatment with chloramphenicol was 16 days, the shortest being three days and the longest 43. When acute infections alone were considered, the average duration of treatment was 6.7 days for gram-positive pyogenic infections and 12.44 for gram-negative or mixed infections. For the acute infections the average duration of illness before treatment with chloramphenicol was 8.6 days and for the chronic infections 1.4 years. For 104 patients other types of chemotherapy had been used unsuccessfully before chloramphenicol therapy was started, and to 72 patients antibiotic therapy was given concurrently for various reasons, the chief one being the presence of mixed bacterial flora.

From the Department of Surgery of the University of Cincinnati College of Medicine and Cincinnati General Hospital.
Read before the Section on Surgery, General and Abdominal, at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.
The aureomycin used in this study was supplied by Lederle Laboratories Division. The chloramphenicol used in this study was supplied by Parke, Davis & Company.
1. Altemeier, W. A.; McMurrin, J. A., and Alt, L. P.: Chloromycetin and Aureomycin in Experimental Gas Gangrene, J. internat. chir. 10: 100, 1950.

The group treated with aureomycin consisted of 13 patients with infections caused by staphylococci, one by Pneumococcus, three by Esch. coli, one by S. typhosa, two by Clostridium tetani, one by Blastomyces and 33 by a mixture of gram-positive and gram-negative microbes. Twenty-nine were male, and 25 were female. The average age was 42.8 years, the youngest being eight months and the eldest 81 years. The average duration of therapy with aureomycin was 12.5 days, the shortest being four and the longest 42 days. For 38 patients, other types of chemotherapy had been used previously, with unsuccessful results, and to 26 patients, another antibiotic was given at the same time.

The indicated surgical procedures were used in conjunction with aureomycin therapy in 29 patients and chloramphenicol therapy in 91 patients.

DOSAGE AND CLINICAL ADMINISTRATION

In this series of patients, the oral route was the preferred method of administration of chloramphenicol and aureomycin, being used as the chief route in 162 patients for the former and in 43 patients for the latter. The rectal route was used in part for the administration of chloramphenicol in 17 patients who were unable to take medication by mouth or who were infants unable to swallow capsules. Aureomycin was given to 11 patients and chloramphenicol to three, by intravenous injection.

TABLE 1.—*Comparison of Group Bacterial Sensitivity to Penicillin, Chloramphenicol and Aureomycin in Vitro*

	Micrograms of Antibiotic per Cubic Centimeter Necessary for Bacterial Inhibition		
Type of Bacteria	Penicillin	Chloramphenicol	Aureomycin
Hemolytic Staph. aureus	0.03	1.0-5.0	0.07-10.0
Nonhem. Staph. aureus	0.05	2.5-5.0	0.10-2.0
Hemolytic Streptococcus	0.008	0.75-2.5	0.25-1.0
Nonhem. Streptococcus	0.03	1.5	0.20-2.5
Str. viridans	0.01	2.5	0.20-10
Pneumococcus	0.03	1.0-2.5	0.5-1.0
Gonococcus	0.03	1.0-2.5	0.25-1.0
Esch. coli	50-500	0.50-12.5	1.0-25.0
A. aerogenes	100-500	0.5	1.0-50.0
Proteus group	50-500	5.0-10.0	2.0-200.0
A. faecalis	0.03-20.0	1.0-50.0	2.0-50.0
Ps. aeruginosa	200-1,000	10.0-50.0	20.0-250.0
S. typhosa	6.0	0.5	1.0-6.0
Cl. perfringens	0.05-1.0	2.0-50.0	1.0-50

In general, the oral dose of both aureomycin and chloramphenicol for adults was 25 to 75 mg. per kilogram of body weight every 24 hours, given in divided doses at intervals of four to six hours. In the treatment of acute surgical infections, the usual dose for a man weighing 150 pounds (68.1 Kg.) was 500 mg. every four hours or 750 mg. every six hours, although in some instances only 250 mg. was given every four hours. The average total dose of chloramphenicol was 24.9 Gm., the least being 3.5 and the greatest 114 Gm. The rectal dose was 30 per cent more than the oral. The average total dose of aureomycin was 27.5 Gm., the greatest being 124.75 and the least 2.6 Gm. After the signs and symptoms of the disease obviously had been brought under control, the dose of either agent usually was reduced, but its administration was continued for two to seven days. In chronic infections, the dose was given over varying periods up to six to nine weeks.

Aureomycin glycinate was found to be a very satisfactory preparation for intravenous administration, being more stable and much less productive of thrombophlebitis than the preparation in leucine used earlier in the study. The intravenous dose used was one fifth that of the oral, or 100 mg. every four to six hours for the average adult.

The lack of a suitable solvent delayed the parenteral administration of chloramphenicol except in unusual circumstances. With a solution of 15 per cent chloramphenicol in propylene glycol, precipitation occurred with aqueous dilution, and a high incidence of thrombophlebitis followed intravenous injection.[2] Repeated injections of 1 cc. of propylene, polyethylene, or polypropylene glycol into guinea pigs produced toxic effects and death,[1] propylene glycol being by far the least toxic, however.

Recently, a suitable parenteral form of chloramphenicol for intravenous use has been developed, containing 25 per cent chloramphenicol in 50 per cent acetyldimethylamine,[2] to which water or saline solution can be added without precipitation of the chloramphenicol. Studies have shown that this preparation is relatively nontoxic for rats and dogs when administered intravenously.[3] Our clinical experience with the parenteral form is very limited, but the presently recommended dose for intravenous injection is 20 to 30 mg. per kilogram per day for the average adult patient.

DIFFUSION INTO TISSUES AND BODY FLUIDS

When administered orally, aureomycin and chloramphenicol are readily absorbed from the gastroenteric tract into the general circulation, and effective antibacterial levels are produced in the blood within 30 minutes, with peak concentrations within one to two hours. Both are diffused readily in bacteriostatic concentration into the lymph, tissues, pleural fluid, bile, peritoneal fluid and cord blood of the newborn.[4] Blood levels are approximately 10 micrograms per cubic centimeter at two hours. Both aureomycin and chloramphenicol are readily and constantly excreted by the kidneys, high concentrations being developed in the urine within two to 16 hours after their administration. With aureomycin, therapeutically effective concentrations appear in the cerebrospinal fluid within six to 12 hours, but there is some question as to the ability of chloramphenicol to penetrate the normal meninges.[4d]

INCIDENCE OF BACTERIAL SUSCEPTIBILITY

Our in vitro studies of the various strains of bacteria within the same species isolated from the patients treated with chloramphenicol and aureomycin revealed wide variation in natural susceptibility and resistance to penicillin, aureomycin and chloramphenicol. Table 2 shows the incidence of susceptibility of the various types of infecting bacteria exhibited at or before the start of treatment, the determinations being made with the gutter plate method, using of 10 micrograms per cubic centimeter for penicillin and 50 micrograms for aureomycin and chloramphenicol. In addition, the serial tube dilution method was used to test questionably susceptible strains.

While it is evident that many of the gram-negative and gram-positive species of pathogenic bacteria commonly associated with surgical infections are susceptible as groups to chloramphenicol and aureomycin, it is also evident that considerable variation in susceptibility occurs within each species and that appreciable percentages of many are resistant to as much as 50 micrograms per cubic centimeter. This is particularly true of the Proteus group, in which the susceptibility of different strains varied from 0 to 35 per cent for aureo-

2. The description of the parenteral form of chloramphenicol was supplied in a personal communication to the authors from Parke, Davis & Company.

3. Deleted in proof.

4. (*a*) Ley, H. L., Jr.; Smadel, J. E., and Crocker, T. T.: Administration of Chloromycetin to Normal Human Subjects, Proc. Soc. Exper. Biol. & Med. **68**: 9, 1948. (*b*) Glazko, A. J.: Distribution and Excretion of Chloramphenicol (Chloromycetin), to be published. (*c*) Glazko, A. J.; Wolf, L. M.; Dill, W. A., and Bratton, A. C., Jr.: Biochemical Studies on Chloramphenicol (Chloromycetin). II. Tissue Distribution and Excretion Studies, J. Pharmacol. & Exper. Therap. **96**:445, 1949. (*d*) Weinstein, L.: The Newer Antibiotics: A Brief Review of the Biological and Clinical Properties of Bacitracin, Polymyxin, Aureomycin, Chloromycetin and Neomycin, Ohio State M. J. **46**: 546, 1950.

mycin and from 25 to 100 per cent for chloramphenicol. Of special importance was the fact that definite but varying percentages of all the groups of bacteria commonly associated with surgical lesions were resistant to each of the three antibiotics—penicillin, chloramphenicol and aureomycin. Similar studies of the incidence of natural resistance within bacterial species have been made by Pulaski,[5] using 500 micrograms per cubic centimeter of chloramphenicol, a concentration 10 times greater than that used by us.

BACTERIAL RESISTANCE ACQUIRED DURING THERAPY

sitive to chloramphenicol, 14 (6.6 per cent) developed by some strains of bacteria during antibiotic therapy in our study, and its incidence is illustrated in table 3. Out of a total of 216 susceptible strains of bacteria sensitive to chloramphenicol, 14 (6.6 per cent) developed resistance while eight out of 88 (9.9 per cent) strains acquired resistance to aureomycin. In the case of penicillin, 12 strains out of a total of 82 (14.6 per cent) acquired resistance during therapy.

Meads[6] also observed the development of fastness to chloramphenicol by nine of 33 strains of gram-negative bacteria during treatment of urinary tract infection in human beings.

These studies indicate that bacterial resistance may develop under treatment with aureomycin, chloramphenicol and penicillin, but it occurred less frequently than in previous studies with streptomycin.

TOXICITY

There was very little evidence of toxicity manifest in the patients treated with chloramphenicol, and no serious toxic reaction developed in any patient. Nausea and vomiting with impairment of appetite were noted in six patients, and diarrhea occurred in one patient. A maculopapular cutaneous rash developed in three patients on the fourth to the seventh day after the start of treatment. In each instance it disappeared within five days after use of the antibiotic agent was discontinued. Stomatitis with brick red discoloration of the mucous membranes of the mouth and burning sensation of the tongue and palate was noted in two patients having maculopapular rashes. The majority of clinical studies also have shown few or no toxic reactions produced by chloramphenicol. No evidence of suppression of the bone marrow with hemopoietic changes was observed. Hemopoietic changes have been observed in experimental animals and human patients by various observers, however. Smith and his associates[7] noted the development of anemia in three dogs receiving 72 to 88 mg. per kilogram of body weight per day intramuscularly, and Volini and his associates[8] described a severe reversible granulocytic maturation arrest in the bone marrow. In view of our clinical experience and that of other observers,[9] hemopoietic changes would seem to be infrequent in patients treated with doses of chloramphenicol up to 3 Gm. a day.

Side effects attending the administration of aureomycin were more frequent, occurring in 13 patients (24 per cent), but they were almost entirely symptoms of mild or moderate irritation of the gastroenteric tract. Nausea with or without vomiting in nine patients, pruritis in two of the patients with nausea, and stomatitis were observed. No serious toxic effects were noted, and there was no evidence of anemia, leukopenia, renal irritation, liver impairment or dermatitis. Peck and Feldman[10] have described three patients with circumstantial evidence of allergic skin reactions due to aureomycin, and Parets[11] reported a severe reaction consist-

TABLE 2.—*Incidence of Bacterial Susceptibility to Penicillin, Aureomycin and Chloramphenicol*

Organisms	Penicillin			Aureomycin			Chloramphenicol		
	Total Strains	Susceptible Strains No.	%	Total Strains	Susceptible Strains No.	%	Total Strains	Susceptible Strains No.	%
Esch. coli	50	0	..	40	18	45	51	39	76
Proteus group	75	0	..	57	13	23	70	38	54
A. aerogenes	19	0	..	21	4	20	22	18	82
Ps. aeruginosa	23	0	..	21	2	10	29	10	34
A. faecalis	6	0	..	5	2	40	6	4	67
Hemolytic Staph. aureus	39	16	41	24	16	67	47	40	85
Nonhem. Staph. aureus	53	20	38	43	17	40	56	38	68
Nonhem. Staph. albus	7	5	71	6	4	67	6	5	83
Hemolytic Streptococcus	18	13	72	13	7	54	15	12	80
Nonhem. Streptococcus	32	7	22	23	6	26	32	25	78
Str. viridans	4	3	75	4	2	50	3	3	100
Anaerobic Streptococcus	8	4	50	4	0	..	6	3	50
Cl. perfringens	19	14	74	17	10	60	18	13	72

TABLE 3.—*Incidence of Acquired Bacterial Resistance During Treatment*

Organism	Days of Therapy
Penicillin	
Hemolytic Staph. aureus	8
Hemolytic Staph. aureus	8
Hemolytic Staph. aureus	7
Hemolytic Staph. aureus	7
Nonhemolytic Staph. aureus	5
Nonhemolytic Staph. aureus	3
Nonhemolytic Staph. aureus	30
Nonhemolytic Staph. albus	11
Hemolytic Streptococcus	11
Nonhemolytic Streptococcus	2
Nonhemolytic Streptococcus	29
Nonhemolytic Streptococcus	40
Chloramphenicol	
Hemolytic Staph. aureus	11
Hemolytic Staph. aureus	4
Hemolytic Staph. aureus	17
Nonhemolytic Staph aureus	14
Nonhemolytic Staph. aureus	30
Hemolytic Streptococcus	32
Hemolytic Streptococcus	16
Anaerobic Streptococcus	21
Nonhemolytic Streptococcus	13
P. pseudovalerici	12
P. morganii	19
P. morganii	9
P. mirabilis	19
Aureomycin	
Hemolytic Staph. aureus	30
Nonhemolytic Staph. aureus	10
Nonhemolytic Streptococcus	29
Nonhemolytic Streptococcus	49
Nonhemolytic Streptococcus	49
Esch. coli	18
Cl. perfringens	2
P. bombycis	10

5. Pulaski, E. J.: Personal communication to the author.

6. Meads, M.: Chloramphenicol-Fastness: In Vivo and in Vitro, to be published.

7. Smith, R. M.; Joslyn, D. A.; Gruhzit, O. M.; McLean, I. W., Jr.; Penner, M. A., and Ehrlich, J.: Chloromycetin: Biological Studies, J. Bact. **55**: 425, 1948.

8. Volini, I. F., and others: Hemopoietic Changes During Administration of Chloramphenicol (Chloromycetin®), J. A. M. A. **142**: 1333 (April 29) 1950.

9. (*a*) [a.c.] (*b*) Stevenson, C. S.; Kohlerman, N. J., and Snider, E. F.: The Treatment of Pelvic Inflammation Disease in Women with Chloramphenicol, personal communication to the author. (*c*) Smadel, J. E.: Clinical Use of the Antibiotic Chloramphenicol (Chloromycetin®), J. A. M. A. **142**: 315 (Feb. 4) 1950. (*d*) Gray, J. D.: Observations on Chloramphenicol, Lancet **1**: 150, 1950.

10. Peck, S. M., and Feldman, F. F.: Sensitivity Reactions to Aureomycin, J. A. M. A. **142**: 1137 (April 15) 1950.

11. Parets, A. D.: Angioneurotic Edema and Rash Due to Aureomycin, J. A. M. A. **143**: 653 (June 17) 1950.

ing of angioneurotic edema of the face and a generalized erythematous skin eruption. A Herxheimer type of febrile reaction has been noted in the treatment of brucellosis by Spink and his associates,[12] and of the early stages of syphilis by Rodriquez and his associates.[13] Isolated instances of stomatitis similar to that developing in one of our patients, with burning sensation and dull reddish discoloration of the mucous membranes have been described by Lennette, Meiklejohn and Thelen,[14] Riese [15] and Meiklejohn and Shragg.[16] With the intravenous administration of aureomycin in leucine solution, local thrombophlebitis developed after 30 to 40 per cent of the injections, but its occurrence has been diminished by the use of aureomycin glycinate.

CLINICAL RESULTS

Obviously, the number and variety of clinical cases studied are insufficient for statistically significant conclusions to be drawn. Many factors that always make the evaluation of new chemotherapeutic agents in surgical infections difficult must be kept in mind. These include the clinical variation of the infection in different persons, the normal tendency of many surgical infections to heal spontaneously after operation, the variation of the host's response to infection, the bacterial synergism and the simultaneous presence of other metabolic diseases, injuries or infections that may cause the patient's death even though the infection in question is controlled by the chemotherapeutic agent. However, on the basis of a comparison of the clinical results obtained with chloramphenicol and aureomycin and those obtained previously in extensive experience with the sulfonamides, penicillin, streptomycin and bacitracin,[17] certain clinical impressions were obtained which seemed to be valid.

TABLE 4.—*Results in Staphylococcic Infections*

No.	Type	Result: Excellent	Good	Questionable
Chloramphenicol-Treated Patients				
9	Cellulitis	6	2	1
10	Wound infection	4	5	1
12	Abscess	2	10	..
1	Peritonitis	..	1	..
5	Osteomyelitis	1	3	1
37		13	21	3
Aureomycin-Treated Patients				
2	Septicemia	2	..	..
7	Wound infection	2	4	1
4	Osteomyelitis	1	2	1
13		5	6	2

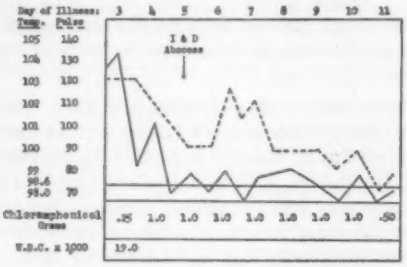

Fig. 1.—Chart of M. D., a white girl aged 3 years who had cellulitis of the left arm and axillary lymphadenopathy of three days' duration produced by hemolytic Staphylococcus and hemolytic Streptococcus. Under treatment with chloramphenicol, the temperature fell to a normal level and the cellulitis disappeared. The localized abscess developing on the third day of treatment was incised and drained.

Staphylococcic Infections.—Thirty-seven surgical infections produced by the hemolytic and the nonhemolytic Staphylococcus aureus were treated with chloramphenicol and 13 with aureomycin, including wound infections, cellulitis, abscesses, peritonitis and osteomyelitis. The hemolytic Staph. aureus was the usual pathogen. The infecting hemolytic Staph. aureus was found to be resistant to penicillin in vitro in 11 patients who responded well to chloramphenicol and in eight of those responding well to aureomycin.

An excellent result was associated with improvement beginning within 24 to 36 hours, return of temperature to normal within 72 hours or less and spontaneous resolution of the process. This was particularly true of the cases of cellulitis, regardless of their extent. In the cases in which the results were considered to be good, the infection usually was of long duration and septic necrosis of tissue had already occurred, necessitating surgical drainage (figs. 1 and 2). Although, in general, the chemotherapeutic response in this type of infection was not so decisive as it usually was with penicillin, it is noteworthy that it was very satisfactory and that only

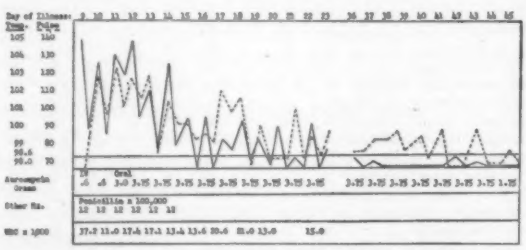

Fig. 2.—Chart of V. W., who had septicemia caused by hemolytic Staph. aureus complicating septic abortion. The infecting Staphylococcus was resistant in vitro to penicillin and chloramphenicol but sensitive to aureomycin. Improvement followed the use of aureomycin, but signs of endocarditis developed, and the patient was transferred to the medical service.

12. Spink, W. W.; Braude, A. I.; Castanedo, M. R., and Sylva Goyt'a, R.: Aureomycin Therapy in Human Brucellos's Due to Brucella Melitensis, J. A. M. A. **138**: 1145 (Dec. 18) 1948. Braude, A. I.; Hall, W. H., and Spink, W. W.: Aureomycin Therapy in Human Brucellosis Due to Brucella Abortus, ibid. **141**: 831 (Nov. 19) 1949.

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14. Lennette, E. H.; Meiklejohn, G., and Thelen, H. M.: Treatment of Q Fever in Man with Aureomycin, Ann. New York Acad. Sc. **51**: 331, 1948.

15. Riese, J. A.: Toxic Reaction to Aureomycin, J. M. Soc. New Jersey **46**: 467, 1949.

16. Meiklejohn, G., and Shragg, R. I.: Aureomycin in Primary Atypical Pneumonia: A Controlled Evaluation, J. A. M. A. **140**: 391 (May 28) 1949.

17. Altemeier, W. A., and Wadsworth, C. L.: Penicillin: Its Use in Surgery and Influence on Earlier Types of Chemotherapy, Surg., Gynec. & Obst. **84**: 540, 1947. Altemeier, W. A.: Penicillin Therapy with Prolonged Interval Dosage Schedule, Ann. Surg. **128**: 708, 1948; Symposium on Recent Advances in Surgery: Newer Antibacterial Agents in Surgery, S. Clin. North America **29**: 1285, 1949; Chemotherapy in Surgery, Nelson's Monographs on Surgery, New York, Thos. Nelson & Sons, 1950, pp. 3-76. Meleney, F. L.; Altemeier, W. A.; Longacre, A. B.; Pulaski, E. J., and Zintel, H. A.: The Results of the Systemic Administration of the Antibiotic Bacitracin in Surgical Infections: A Preliminary Report, Ann. Surg. **128**: 714, 1948. Meleney, F. L.; Longacre, A. B.; Altemeier, W. A.; Reisner, E. H., Jr.; Pulaski, E. J., and Zintel, H. A.: The Efficacy and the Safety of the Intramuscular Administration of Bacitracin in Various Types of Surgical and Certain Medical Infections, Surg., Gynec. & Obst. **89**: 657, 1949.

one strain of the infecting staphylococci was resistant to chloramphenicol and only two to aureomycin.

Aerobic Streptococcus Infections.—Only a small number of patients with aerobic Streptococcus infections were treated, consisting of three with cellulitis and two with infected wounds, all of whom were treated with chloramphenicol. The etiological agent was the aerobic hemolytic Streptococcus. The response was excellent in two cases, good in two and questionable in one. In the last instance, the organism was resistant to chloramphenicol in vitro.

Anaerobic Streptococcus Infections.—Three patients with anaerobic streptococcus infections resistant to penicillin were treated. In one patient with recurrent abscesses of the right breast and a burrowing sinus tract of three years' duration caused by a nonhemolytic anaerobic Streptococcus, an excellent result was obtained with chloramphenicol administered orally for 17 days. Complete disappearance of all clinical evidence of the infections occurred with cessation of the discharge and disappearance of redness, induration and

TABLE 5.—*Results in Gram-Negative Bacterial Infections*

No.	Type	Result: Excellent	Good	Questionable
Chloramphenicol-Treated Patients				
8	Septicemia	2	1	..
4	Peritonitis	1	2	1
3	Postoperative wound infection	1	1	1
2	Typhoid	3	..	..
2	Cholangitis	2	..	..
1	Retroperitoneal cellulitis	..	1	..
1	Acute urinary tract infection	..	1	..
1	Lymphadenitis	..	1	..
18		9	7	2
Aureomycin-Treated Patients				
1	Septicemia	..	1	..
2	Cholangitis	2	..	..
1	Peritonitis	..	..	1
4		2	1	1

fever. In two other patients with chronic burrowing ulcerations, one of the buttocks and the other of the axilla, which were produced by the hemolytic anaerobic Streptococcus, the administration of chloramphenicol was followed by a good result in one and a failure in the other. In both instances the treatment was accompanied with attempted surgical excision of the ulceration. Unfortunately, no patients with anaerobic Streptococcus infection presented themselves for treatment after aureomycin was made available to us.

"Pure" Gram-Negative Bacterial Infections.—The results of chloramphenicol and aureomycin therapy in a group of "pure" gram-negative bacterial infections were encouraging. The cases included peritonitis, postoperative wound infections, septicemia, typhoid infections, cholangitis, retroperitoneal cellulitis and acute urinary tract infection. The bacteria involved were chiefly Esch. coli, A. aerogenes, Ps. aeruginosa, and S. typhosa. In 16 of the 18 patients treated with chloramphenicol and in three of the four treated with aureomycin, the response was good or excellent. In two others the infecting organism was Ps. aeruginosa, which was resistant to chloramphenicol, and in the third, Proteus vulgaris, which was resistant to aureomycin.

In one patient with peritonitis, intra-abdominal abscess and septicemia caused by Ps. aeruginosa a gratifying response was obtained with chloramphenicol, the blood stream being sterilized and recovery proceeding after drainage of the abscess. A patient with a similar Esch. coli septicemia responded well to aureomycin.

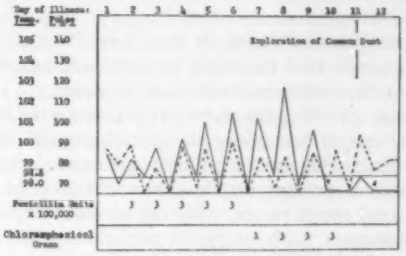

Fig. 3.—Chart of R. W., who had septic cholangitis secondary to choledocholithiasis with obstruction of the common duct caused by Esch. coli.

In the patients with infections due to Ps. aeruginosa, a questionable result was obtained with chloramphenicol in two and a favorable result in four. The response to chloramphenicol in two patients with septic cholangitis produced by Esch. coli and P. vulgaris was excellent, and in two patients with similar cholangitis caused by Esch. coli, aureomycin produced an excellent response (figs. 3 and 4). After the use of chloramphenicol and penicillin, one patient who had had pylephlebitis with peritonitis and Esch. coli septicemia following an acute perforated appendicitis recovered, with control of the septic course, sterilization of the blood stream and gradual return of the temperature to normal (fig. 5).

Mixed Gram-Positive and Gram-Negative Infections.—Many varieties of mixed infections were treated with chloramphenicol and aureomycin, including wound infection, peritonitis, peritonitis with intraabdominal abscess, empyema, perinephritic abscess, sinus tracts, purulent otitis media, chronic osteomyelitis, urinary

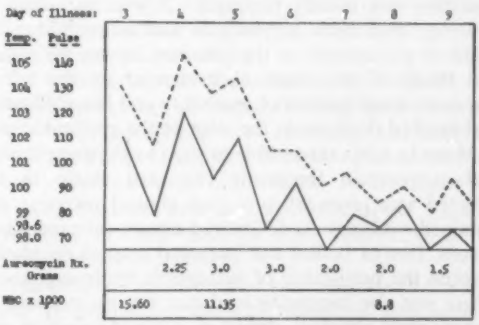

Fig. 4.—Chart of D. M., a 44 year old white man, who had acute cholangitis four months after a cholecystectomy and exploration of the common duct. Treatment with aureomycin was followed by prompt improvement, with rapid fall of temperature and pulse rate, disappearance of chills and incomplete clearance of jaundice.

tract infections and crepitant cellulitis of the abdominal wall. An excellent or good result was noted in 71.8 per cent of the acute cases in which chloramphenicol was used and in 66.6 per cent of those in which aureomycin

was administered. The initial favorable response, however, was apt to be temporary if surgical treatment was not carried out concomitantly. In a few instances of rapidly spreading mixed infections, the response was exceedingly gratifying. In chronic wound infections of mixed bacterial origin, however, the clinical response was less satisfactory and failures occurred more frequently.

Chloramphenicol failed to have any effect on three patients with mixed infections in metastatic carcinomas of the axilla, abdominal wall and perineum.

A total of 38 patients with peritonitis of mixed bacterial origin secondary to gastrointestinal disease were treated. Of the 11 patients with acute spreading peritonitis, a prompt response was obtained in three and a good result in six, with use of chloramphenicol in conjunction with surgical procedure. Likewise, a good result was obtained in six out of seven patients with similar infections treated with aureomycin.

In the 20 patients with intraabdominal abscesses in association with peritonitis, it was exceedingly difficult to evaluate the effect of the antibiotics used. The infection was brought under control more slowly and with more difficulty, and incision and drainage of the

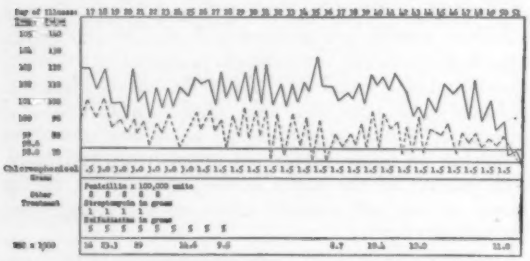

Fig. 5.—Chart of L. S., a white woman aged 46 who had pylephlebitis and Esch. coli septicemia complicating an acute perforated appendicitis with abscess. Incision and drainage were done on the seventh day of illness. Results of blood cultures, which had become positive while the patient was under treatment with penicillin, streptomycin and sulfadiazine, were negative 24 hours after chloramphenicol was administered. After a protracted febrile course, the patient recovered.

abscesses was usually required. It was our opinion, however, that both aureomycin and chloramphenicol aided in the control of the infection in approximately two thirds of the cases, as evidenced by the febrile response, short periods of morbidity and hospitalization and marked decrease in the odor of the peritonitic pus.

Many bacteria susceptible in vitro to chloramphenicol and aureomycin frequently remained viable in the infected area, even when a good clinical response was obtained. Abscesses, devitalized tissues, infected tumor tissues, foreign bodies and impaired arterial circulation favored the persistence of susceptible micro-organisms. There was also suggestive evidence that the presence of one or more resistant strains in a mixed infection predisposed to the persistence of sensitive strains in the wound discharges.

The experience of Stevenson, Kohlerman and Snider [9b] in 17 cases of pelvic inflammatory disease of both puerperal and nonpuerperal types also indicates the effectiveness of chloramphenicol in infections of mixed bacterial origin. The length of hospitalization seemed to be reduced one half, and definitive surgical cure was possible much sooner than it had been formerly. Of particular interest was the fact that in many of the cases, laparotomy was done within two to three weeks after the onset of chloramphenicol therapy, and definitive surgical cure was accomplished with excision of the abscess or involved tube and ovary.

Table 6.—*Results in Mixed Gram-Negative and Gram-Positive Infections*

Chloramphenicol-Treated Patients		Result			
No.	Type	Excellent	Good	Questionable	Failure
25	Wound infections	6	13	3	3
11	Peritonitis	3	6	1	1
17	Peritonitis with intraabdominal abscess	..	11	5	1 (death)
10	Soft tissue abscess	..	8	2	..
4	Empyema	1	2	..	1 (death)
1	Perinephritic abscess	..	..	1	..
4	Acute urinary tract infection	1	2	1	..
1	Periurethral abscess	..	1	..	..
3	Infected sinus tract	1	1	1	..
1	Purulent otitis media	..	1	..	..
5	Chronic osteomyelitis	1	2	1	1
1	Cholangitis	1	..	..	..
3	Aspiration pneumonia	1	2	..	..
3	Crepitant cellulitis of abdominal wall	..	..	1	2
2	Suppurative hepatitis	..	1	1	..
91		15	50	17	9

In experimentally induced peritonitis, Pulaski and Connell [18] found that chloramphenicol therapy saved 60 per cent of the animals when it was begun four hours after peritoneal soilage, whereas 90 per cent of the untreated animals died. Yeager and his associates [19] have also studied the beneficial effects of aureomycin and chloramphenicol in experimental and clinical peritonitis.

Miscellaneous Infections.—A variety of miscellaneous lesions were studied. Five patients with venereal lymphogranuloma showed variable responses to chloramphenicol therapy. The results were considered excellent in two patients, good in one, questionable in one and undetermined in one. In two patients with lymphogranulomatosis, temporary improvement occurred for two to six weeks following therapy with chloramphenicol for 14 and 15 days, but exacerbation of the process occurred in both instances later.

Table 7.—*Results in Gram-Negative Bacterial Infections*

No. of Patients	Type	Result: Excellent	Good	Questionable	Failure
21	Postoperative wound infections	..	12	5	4
7	Peritonitis	..	6	1	..
3	Peritonitis with abscess	..	2	1	..
2	Urinary tract infections	1	1	..	..
33		1	21	7	4

In one patient with blastomycosis treated for 12 days with chloramphenicol and another treated for 10

18. Pulaski, E. J., and Connell, J. S.: Control of Peritoneal Infection in Gastro-Intestinal Surgery, Bull. U. S. Army M. Dept. 91: 265, 1949.

19. Yeager, G. H.; Byerly, Wm. L., Jr., and Holbrook, Wm. A.: Streptomycin, Aureomycin and Chloromycetin: Experimental and Clinical Comparison, Ann. Surg. 130: 576, 1949.

days with aureomycin, no evidence of beneficial response was detected.

Two symbiotic ulcers produced by hemolytic staphylococci and nonhemolytic anaerobic streptococci responded to chloramphenicol therapy after failing to respond to penicillin.

Notable improvement occurred in a patient with active terminal ileitis under treatment with chloramphenicol for 30 days. The number of stools was reduced from eight to two within one week, and marked subjective improvement followed. It is questionable whether this effect can be attributed to chloramphenicol and whether the improvement will persist. An excellent result was obtained in a patient with cavernous sinus thrombosis of unknown bacterial origin. The results in three patients with tuberculous osteomyelitis were poor.

RESULTS IN EXPERIMENTAL GAS GANGRENE

In vitro studies in our laboratory indicated that 13 of 18 strains of Cl. perfringens were susceptible to chloramphenicol and seven of 10 were susceptible to aureomycin. Studies of experimental infections in guinea

TABLE 8.—*Results in Miscellaneous Lesions*

Chloramphenicol-Treated Patients

No.	Type	Results			
		Excellent	Good	Questionable	Failure
5	Venereal lymphogranuloma	2	1	2	..
2	Lymphogranulomatosis	..	..	..	2
1	Blastomycosis	..	..	..	1
2	Cholangitis	2	..	..	..
4	Cl. perfringens infection	1	2	..	1
6	Cellulitis (undetermined origin)	5	1	..	..
2	Intraperitoneal abscess	..	1	1	..
1	Lymphadenitis	1	..	..	..
1	Subacute arthritis	..	..	1	..
1	Cavernous sinus thrombosis	1	..	..	..
3	Tuberculous osteomyelitis	..	..	1	..
1	Terminal ileitis	..	..	1	..
29		12	5	6	6

pigs, produced by injections of one or more minimum lethal doses of a susceptible strain of Cl. perfringens into closed wounds containing crushed muscle and sterilized dirt,[20] indicated that chloramphenicol and aureomycin possess marked antibacterial activity in vivo for highly virulent and susceptible strains of Cl. perfringens isolated from war wounds. Their effectiveness was greatest in the animals treated immediately after bacterial inoculation, and it diminished as the infection became more established. Similar studies by Sandusky,[21] using a single dose of chloramphenicol or aureomycin, also showed a definite beneficial effect on experimental infections produced by Cl. perfringens in guinea pigs.

COMMENT

An analysis of the results obtained in these studies indicates that chloramphenicol and aureomycin are valuable additions to the field of chemotherapy and that they have extended considerably the possibilities of effective chemotherapy for surgical infections. Little evidence of toxicity has been noted in our patients treated clinically, the untoward reactions in 179 patients treated with chloramphenicol consisting of mild gastrointestinal irritation in six, cutaneous rash in three and stomatitis in two. Suppression of the bone marrow and hemopoietic changes have not been seen in our patients receiving the usual doses of chloramphenicol. The side effects associated with the administration of aureomycin were more frequent but consisted almost entirely of symptoms of mild or moderate irritation of the gastrointestinal tract.

The results obtained in the gram-negative bacillary infections indicate clearly the effectiveness of both antibiotics in these lesions, provided that the etiological agents are susceptible. Infections produced by Esch. coli, A. aerogenes and P. vulgaris generally responded well to chloramphenicol therapy, and those caused by Ps. aeruginosa responded satisfactorily in four out of six cases. The recovery of two patients, one with Ps. aeruginosa bacteremia and one with pylephlebitis and Esch. coli bacteremia, was particularly remarkable. A smaller number of infections caused by Esch. coli and A. aerogenes responded equally well to aureomycin therapy. The results obtained with chloramphenicol in three patients with S. typhosa infection were impressive and similar to those reported by Woodward and his associates.[22] The in vitro studies indicate that Ps. aeruginosa and P. vulgaris are relatively resistant to aureomycin, and its use in infections produced by these bacteria should be secondary to sensitivity studies only. In view of their effectiveness, ease of administration and low incidence of untoward reactions, chloramphenicol and aureomycin appear to be preferable to streptomycin in the management of most gram-negative bacillary infections.

Acute pyogenic infections produced by gram-positive cocci responded very well to aureomycin and chloramphenicol therapy, and this observation has been substantiated by Pulaski.[5] However, the response was usually not so decisive as that generally obtained with penicillin. In penicillin-resistant infections produced by these organisms, both aureomycin and chloramphenicol have been particularly effective and valuable. Chronic pyogenic infections, particularly those associated with necrosis of bone, showed a more limited response, although satisfactory results were obtained when either agent was used in conjunction with the indicated surgical procedure.

Of significance was the observation (table 2) that a larger percentage of hemolytic staphylococci in this study were susceptible to aureomycin and chloramphenicol than to penicillin. Penicillin and aureomycin were bacteriostatic in more dilute concentration for the pyogenic cocci than chloramphenicol, but a greater percentage of these bacteria were susceptible to the action of chloramphenicol.

The evidence indicates that penicillin is still the antibiotic of choice for surgical infections produced by susceptible gram-positive pyogenic cocci and that

20. Altemeier, W. A.; McMurrin, J. A., and Alt, L. P.: Chloromycetin and Aureomycin in Experimental Gas Gangrene, J. internat. chir. **10**: 100, 1950.

21. Sandusky, W. R.: An Evaluation of Aureomycin and Chloromycetin (Chloramphenicol) in Experimental Clostridium Welchii Infection, J. internat. chir. **10**: 92, 1950.

22. Woodward, T. E.; Smadel, J. E.; Ley, H. L., Jr.; Green, R. R., and Mankikar, D. S.: Preliminary Report on the Beneficial Effect of Chloromycetin in the Treatment of Typhoid Fever, Ann. Int. Med. **29**: 131, 1948.

aureomycin and chloramphenicol have extended significantly the possibilities of effective chemotherapy in lesions of this type.

There are indications that aureomycin and chloramphenicol will be of considerable value in the treatment of a large group of mixed gram-positive and gram-negative bacterial infections. Lesions produced by such a mixture of organisms have been notably resistant to chemotherapy and other forms of treatment because of the synergism of the infecting bacteria and their tendency toward the production of necrosis, extensive abscesses in the peritoneal and pleural cavities, marked toxemia and progressive spread. Since most mixed infections require surgical treatment, an excellent result with prompt and spontaneous resolution of the process is obtained infrequently. The results of treatment with either of these antibiotics and the indicated surgical procedure were good in the majority of instances, the invasive qualities of the infection being quickly overcome and the local manifestations of the infection disappearing at varying rates. However, the presence of resistant strains, tardy diagnosis or delayed surgical drainage tended to produce a questionable result or failure. There were indications that the efficacy of aureomycin or chloramphenicol in the type of infection in which some of the infecting bacteria were resistant could be increased by the concomitant use of other chemotherapeutic agents to which the organisms were susceptible in vitro. It must be remembered that antibiotics generally repress the growth of infecting microbes until the natural local and humoral defensive mechanisms can remove them, permitting the host to develop immunity.

In acute septic peritonitis secondary to perforation or inflammation of the gastrointestinal or genitourinary tract, the evidence also suggests that the combined administration of penicillin and chloramphenicol or aureomycin produced more complete antibacterial coverage and more effective treatment. The over-all importance of surgery in this type of peritonitis cannot be overemphasized.

Studies in experimental gas gangrene produced by susceptible strains of Cl. perfringens indicate that aureomycin and chloramphenicol, like penicillin, should be effective adjuncts to good surgery in the prevention and treatment of this infection.

The antirickettsial and antiviral activities of aureomycin and chloramphenicol have not yet been of much benefit in surgical practice. In venereal lymphogranuloma, chloramphenicol seems to hold some promise, particularly in the earlier stages of the disease, and considerable improvement has occurred when the disease was associated with intraabdominal granulomas and abscesses.

Although the tendency for bacteria to acquire resistance to chloramphenicol or aureomycin appears to be much less than to streptomycin, it does exist. The development of bacterial resistance to chloramphenicol in 14 of 179 cases and to aureomycin in eight of 54 cases emphasizes the importance of intelligent use of this antibiotic agent and avoidance of its administration without definite indication, without adequate dosage or without properly timed and executed surgical intervention if indicated. Failure to drain abscesses before, at or shortly after the onset of antibiotic treatment may permit the development of bacterial resistance and result in infections refractory to chemotherapy.

In recent years many surgeons have believed that there is no longer a problem in the control of surgical infections. We do not believe this. Of great practical importance has been the demonstration of the variation in natural susceptibility to penicillin, chloramphenicol and aureomycin occurring within species of microorganisms. This observation emphasizes the complexity of modern antibiotic therapy, which has actually been increased with the development of each new agent. Because of the natural variation of bacterial susceptibility, the development of bacterial resistance during treatment and the increase in numbers of bacterial strains resistant to antibiotics, the necessity for clinicians to have available in local hospitals a good laboratory with a staff capable of giving, readily and quickly, information regarding the types of causative microorganisms and their susceptibility to the various antibiotic agents, both at the start of and during treatment, and the concentrations of the antibiotics produced in the blood and other fluids by the dosage used, becomes obviously important.

ABSTRACT OF DISCUSSION

DR. EDWIN J. PULASKI, San Antonio, Texas: The broad spectrum antibiotics, aureomycin, chloramphenicol and terramycin, increase to seven the number of promising antibiotics available to the surgeon. My asscciates and I have confirmed the trials reported by Dr. Altemeier and the results suggest that these new drugs, together with penicillin or streptomycin, may constitute the antibiotics of choice for the treatment of most surgical infections. As Dr. Altemeier has stated, the multiplicity of drugs has made it imperative that a precise etiological diagnosis be established for every patient with infection. The direct stained smear is often a valuable diagnostic aid before cultural data are available. Culture sensitivity testing should be done in all cases if possible but especially in Staphylcoccus, nonhemolytic Streptcccccus, gram-negative and chronic infections. The availability now of medicated antibiotic disks has made sensitivity tests on agar plate cultures a simple routine procedure, particularly in early detection of drug-resistant micro-organisms. The rapid increase of available antibiotics necessitates constant reevaluation of the practical importance of drug resistance. Surveys in our laboratory during the past four years indicate that penicillin resistance is a problem in only a minority of Staphylococcus and nonhemolytic Streptcccccus infections, especially those acquired in a hospital. With streptomycin, on the other hand, emergence of drug-resistant Proteus and Ps. aeruginosa organisms occurs almost invariably if unhealed lesions persist and drug administration is maintained; with Escherichia coli, resistance to streptomycin is less likely to occur. With the diminished use of streptomycin, brought about by substitution of therapy with newer antibiotics, the number of streptomycin-sensitive strains isolated from open wounds is increasing. It is worthy of emphasis that over 90 per cent of the common surgical organisms (except Proteus and Ps. aeruginosa) are sensitive to aureomycin, chloramphenicol and terramycin. Like Dr. Altemeier, we have recovered chloramphenicol-resistant staphylococci and gram-negative bacilli in a few instances. Resistance is apt to occur in the localizing infection, a fact emphasizing what Dr. Altemeier has stated; namely, that antibiotics are strikingly effective against spreading infection, or "acute" infection. For fulminating infections, such as acute secondary fecal peritonitis, gas gangrene and septicemia, we have returned to use of the intravenous route of medication; we believe the most reliable perfusions of infected tissue in seriously ill patients follow intravenous

administration of antibiotics. With the availability of many antibiotics in sufficient quantity to perfuse tissues through the blood stream, it would seem that local therapy of granulating wounds, fistulous tracts, etc., is less indicated than formerly. While wound sterilization may be occasionally achieved by topical applications, healing will not necessarily follow if the blood supply is deficient and the underlying pathological condition is unfavorable to wound healing.

DR. HORACE J. MCCORKLE, San Francisco: I should like to speak of my experience with antibiotic therapy by saying, first, that there still is something left for the surgeon to do in the management of infections. Correct diagnosis, proper judgment in the surgical management of serious infections, care in prevention of contamination during abdominal operations and other sound surgical principles are just as important as they were before antibiotics were developed. However, antibiotic therapy is a great help to the surgeon in handling some serious infections, and our results in the treatment of such infections with these agents, have been vastly improved. I believe that when the physician is faced with serious surgical infections penicillin should be the drug of first choice. Only in those cases in which penicillin susceptibility has not been proved in the laboratory, or for patients who have not responded adequately to penicillin should we seek other therapy. My experience with chloramphenicol has been greater than that with aureomycin, and results of therapy have been better, particularly in the mixed infections of intestinal origin, with chloramphenicol. However, my asscciates and I have had greater success with penicillin therapy alone than with the use of either of these two drugs. I should like to ask Dr. Altemeier about combinations of the drugs. We have seen no reason why we could not combine the use of at least two of these antibiotic agents in the management of mixed surgical infections. However, there is some evidence in the laboratory, in test tube experiments, that the effectiveness of chloramphenicol and penicillin is less when they are combined than when either is used alone.

DR. MICHAEL E. DEBAKEY, Houston, Texas: I am sure there are those who question the extent to which some of these agents may be used prophylactically. Of course, it is often a matter of judgment. Perhaps we can have Dr. Altemeier comment on that aspect of the problem.

DR. W. A. ALTEMEIER, Cincinnati: The point made by Dr. Pulaski regarding the value of the immediate smear for examination of the infectious material obtained from a lesion is well taken. Our selection of an antibiotic agent for immediate treatment of infections is based on a presumptive diagnosis made of the nature of the infection and the etiological agent. By direct examination of smears of the infectious discharges, it is possible to tell immediately the general type of bacteria that are causing the infection and to choose one or more of the antibiotic agents that are usually effective for that type. This selection of the antibiotic agent may or may not be changed within 24 to 48 hours, depending on the information obtained from the sensitivity tests made on the bacteria cultured from the wound discharges. With a competent laboratory staff, this information can be made available to the clinician for the majority of infections within 48 hours. The other point made by Dr. Pulaski, regarding the overemphasis of resistance of various bacterial strains to penicillin, is also worthy of further comment. It is true that most of the organisms that have acquired resistance are Staphylococci. Pneumococci and streptococci have been less apt to acquire resistance to penicillin. The Streptococci were sensitive to penicillin in 98 per cent of the cases when penicillin first became available, and at the present time they are sensitive in 75 per cent. We also endorse the use of intravenous administration of the various antibiotics for severely ill patients, at least at the start of the infection, and we like to give a larger initial dose than the usual maintenance dose. The use of sound surgical principles is just as important as ever in the treatment of surgical infections. I want to thank Dr. McCorkle for reemphasizing this point. The question of mixing drugs in the treatment of surgical infections is a very pertinent one. In mixed infections, we believe that it is wise to use both penicillin and one of the other antibiotics, such as chloramphenicol or aureomycin, as indicated. We have found no evidence that the combined use detracts from the activity of either agent. Several years ago Dr. Pulaski showed that the combined use of antibiotics delayed the acquisition of resistance by bacteria in severe mixed infections. We have also found that, if a resistant bacterial strain is present in a lesion being treated with penicillin or one of the other antibiotic agents, other bacteria may acquire similar resistance, unless one of the antibiotic agents is used concurrently to overcome the action of the resistant strain. Antibiotics should be used prophylactically in patients with contaminated or potentially infected wounds for the localization and control of infection fostered by derangement of local physiological factors that favors the growth of contaminating bacteria. Their use is also indicated for patients with valvular heart disease subjected to surgery in contaminated fields, such as the mouth.

MEDICAL DEFENSE PLAN OF A METROPOLITAN AREA

Frank F. Schade, M.D., Los Angeles

Although civil defense directives have recently been promulgated by federal authorities, local communities must work out their individual plans on the basis of the situation existing in those communities. In some states directives and coordinating plans have been drawn up. The necessity of having carefully worked-out plans cannot be overemphasized. Modern warfare, in which the conventional high explosive and incendiary bombs will be complemented by atom bombs, and in some cases by guided missiles, can cause casualties in cities that will be counted in the thousands. Because of the large number of casualties, all available medical resources, both personnel and material, must be used in the most efficient manner possible. It must be remembered that not all personnel and facilities will be available because some of them will be among the casualties. Plans must be completely prepared before the disaster strikes, down to the last detail of assigning primary and secondary duties to every person by name.

In an area such as greater Los Angeles, it is especially important for the county medical association to name an active, aggressive civil defense committee to act in an advisory and coordinating capacity to the constituted civil authorities. There are two major political entities, the city of Los Angeles and Los Angeles County, each with a population of around 2,000,000 persons, and over 40 smaller cities and communities. Each of these has its own civil defense ordinances that provide the legal authority and, in some instances, the outline for the organization of the disaster forces. The civil defense committee of the medical association has been recognized by both the city and the county and has been given official status by both. A coordinating council has been named by the city, the county and the League of California Cities. This council has also given official recognition to the committee and has named the committee as the over-all medical coordinating authority.

Organization for medical defense is based on the principle of decentralization. The importance of this can be appreciated when it is realized that the city of

The Health Departments of the county of Los Angeles, under the direction of Roy O. Gilbert, M.D., and the city of Los Angeles, under the direction of George M. Uhl, M.D., have assisted materially in the development of medical defense plans. The charts reproduced herein were prepared by the Health Department of the city of Los Angeles.

Los Angeles covers 450 square miles and the area of the entire county is 4,000 square miles. "Community" areas, 50 in number, have been established, each with a complete organization so that it could function autonomously in the event of a total breakdown of communications. The entire county area has been

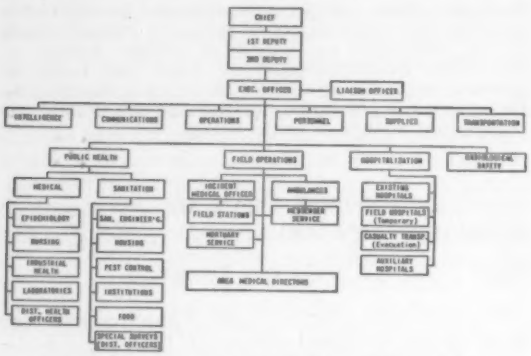

Chart 1.—Organization of the medical division headquarters.

divided into 13 districts, 12 of which roughly correspond to sheriff districts; the thirteenth is made up of the city of Los Angeles. Each of these 12 districts will have a small headquarters group that can maintain administrative control of the areas within the district.

Because of the population concentration in the city and the existing civil government, a much more elaborate organization is provided at this level. In the districts other than that of the city of Los Angeles, the headquarters will be small, consisting of the district medical director and a deputy, with an executive officer (nonmedical) and a supply officer. It is possible that in some cases the district medical officer will also be one of the area medical directors. In the city, the medical division headquarters is organized to provide all phases of medical defense, including logistic support. The city health officer is given the responsibility of the care of the sick and injured. In the county, the health officer is given the responsibility of what should be called field operations, with the Department of Charities in charge of hospitalization. In all instances, provision is made for sufficient depth of personnel, usually three persons, so that there will be reasonable assurance that at least one person who is thoroughly familiar with his phase of the plan will be available. Chart 1 shows the oragnization of the medical division headquarters.

The second deputy to the chief and the deputy to the executive officer are physicians in private practice. There are other private physicians in all sections that have to do with medical care. A similar type of organization, with some modifications, can be used for any of the communities within the county.

Chart 2 shows the organization of the "community" area medical service. These areas in some cases are actual communities, and in other cases they represent a section of a city. All the sections provided for in the medical division headquarters are also present in the area headquarters. One major difference is the position of the executive officer. At the medical division headquarters the executive officer is a physician, a full time employee of the City Health Department, whereas in the area he is not a physician. Practically without exception, the personnel of the areas are private citizens.

During the preparatory phase, the various sections of the medical division establish liaison with their corresponding section of the general headquarters, when such a section exists. Planning is done in cooperation with the appropriate section of the general headquarters, to eliminate duplication of effort and to reduce confusion to the lowest possible level. As an example, medical supplies will be contracted for by the city purchasing agent, on the recommendation of the chief of the medical division, through his supply officer.

The operations section will coordinate and integrate into the plan the functions of the several supporting services and the medical services. The chief of operations will plan the actual layout and functioning of the central control headquarters when the plan becomes operational. This planning will be done in close cooperation with the executive officer.

The hospitalization section will plan to use existing hospitals, expanded to the maximum by setting up emergency beds and cots in auditoriums, halls, solariums, classrooms and so forth. One fundamental of the hospital plan will be the provision for automatic evacuation of all convalescent patients, without prior consent of the attending physician. These patients will be taken to auxiliary hospitals, which in many cases will be in hotels. Existing beds, toilet facilities, cooking facilities and personnel accustomed to rendering services make hotels ideal for this purpose. Existing hospital beds will be woefully inadequate; so provision must be made for temporary hospitals. These temporary hospitals will also serve to take the patients of existing hospitals that become untenable. This section must also plan to evacuate patients some distance from

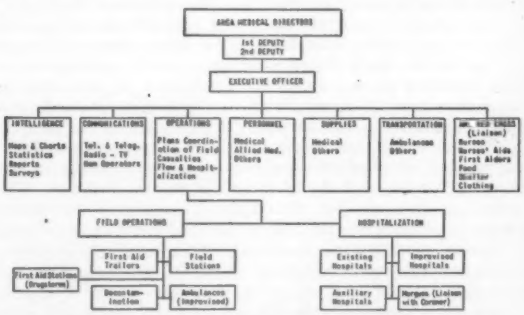

Chart 2.—Organization of the "community" area medical service.

the city if the situation so indicates. Inland cities that have not been involved in the disaster and that are not considered to be of great strategic importance will probably be called on to receive fairly large numbers of casualties.

The hospitals of the community have been surveyed, and they have furnished certain data pertaining to their physical plants and staff members. Information was submitted, among other things, on the steam power

plants, the auxiliary electric power system (if such exists), the number of actual and potential operating rooms, water storage facilities, elevators and blood-processing potential. Lists of staff members were submitted, nominating personnel for triage, shock, surgical and burn teams and for general duty in the hospital. A surgical team is to consist of a surgeon, assistant, anesthetist, scrub nurse and circulating nurse. Two

Personnel Required in Temporary Hospitals

Bed Capacity	Physicians	Non-medical Officers	Nurses	Enrolled Personnel	Total
100	19	9	20	92	140
200	32	9	36	134	211
300	47	9	52	175	283
400	60	9	68	214	351
500	73	9	84	200	426

teams will be assigned to each operating room so that they can function around the clock for several days. The same type of operation is planned for the other teams. It has been found that the local hospital association can be of great assistance during this phase of planning. It is absolutely necessary for a central authority, such as the civil defense committee, to adjust the personnel lists submitted by the hospitals. In some cases a physician appears on the lists of several hospitals, and these differences must be resolved, usually on the basis of assignment to the hospital nearest his home. All these persons are assigned a secondary duty in a temporary hospital in the event that the hospital to which they are assigned becomes untenable.

Temporary hospitals are planned in units of 100 beds; the required number of physicians, nurses and other personnel are shown in the table.

If hotels are used, certain of the nonmedical and enrolled personnel can be deleted, depending on the services the hotel can furnish, such as cooking and laundry.

Lists of minimal supply requirements have also been compiled, again on the basis of 100 bed units, for a 10 day supply period. The lists are too voluminous to be included in this report.

It is planned to establish the temporary hospitals in buildings with large floor space. Gymnasiums of high schools and universities are considered to be ideal because of the floor space, toilet facilities and reserve emergency water supply in the swimming pools. Several hospital centers have been planned for universities, the gymnasiums being used for acute cases, the adjacent dormitories for convalescent cases and nearby campus areas for tent expansion. The cafeterias will be used for diet kitchens.

Field operations are under the direction of the manager of the city emergency hospital system. It will be his duty to cause damaged areas to be inspected as soon as possible, in order to get a fairly accurate casualty estimate into central control headquarters as soon as possible. Members of field operations will also start to render first care to casualties in cooperation with field operations personnel of the area medical organization. Field operations personnel will be informed through central control headquarters of the number of casualties to be taken to specific hospitals. The doctor at the scene of the damaged area will be the incident medical officer. He will route patients either directly to hospitals indicated by central control headquarters or to a field aid station for such treatment as adjustment of improvised splints, control of serious hemorrhage, administration of narcotics and sedatives and, in some cases, for the treatment of shock. In some of the smaller communities a field operations section may not be necessary, the duties being absorbed by the area medical directors.

The area medical director will mobilize such field stations as may be either necessary or feasible. As indicated above, some type of definitive treatment, crude as it may be, will be initiated at these stations. Communications permitting, central headquarters will maintain control of all phases of the operation—from incident medical officers at the scene, through field operations and area medical organization to hospitalization, either locally or at a distant city.

During operations, the central control headquarters will be under the direct supervision of the executive officer or one of his deputies. The intelligence and communications sections will clear all incoming messages through him; many of these will be informational only. As soon as a comprehensive estimate of the situation is made, hospitals will be informed of the number of casualties to expect, and any necessary temporary hospitals will be mobilized. Estimates of required personnel and supplies from outside will be made and forwarded to the chief or one of his deputies. He, in turn, will transmit such requests to the person in command of the over-all disaster program for transmission to the proper sources for action. A similar control center will be set up by the county and by all of the other communities.

The operation can be only as successful as its logistic support, for without evacuation, supplies, communications and transportation nothing can be accomplished. It is a false premise to depend on other agencies to arrange these services for the medical division. For

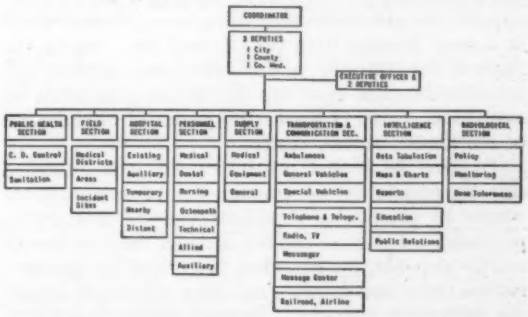

Chart 3.—Proposed organization of the master medical control center for the civil defense of Los Angeles County and the included cities (Nov. 10, 1950). Each section is to have one chief and two deputies. The coordinator and his deputies; the field and hospital section chiefs and their deputies are to be physicians. The other section chiefs and/or deputies need not be physicians. One member of the personnel section is to be the executive secretary of the county medical association. One transportation and one communication expert is to be on the staff of the transportation and communication section. One educator and one public relations expert is to be on the staff of the intelligence section.

this reason, all these services have been provided for from the staff of the medical division down to, and including, the staff of the area medical director. Much

can be accomplished through cooperation with existing allied groups. The Retail Druggists Association has aided greatly by surveying the stores of their members for stock levels of certain specified items, such as hypodermic syringes and needles, antibiotics and sulfonamide preparations, dressings and bandages, narcotics and sedatives, antiseptics, fluids for intravenous administration, plasma and petrolatum. These supplies, plus those in wholesale drug firms and branches of manufacturers, form the first available stockpile. Adequate stockpiles cannot and should not be set up. The cost would be prohibitive, and if all major cities embarked on stockpiling existing stores throughout the country would be rapidly depleted. Some of the required items are partly or completely perishable, a fact that again contraindicates stockpiling. It is not unreasonable to ask that certain critical items be carried at somewhat higher stock levels, but such lists must be very carefully controlled.

The implications are of a medical operation in the cities of the United States unheard of in scope prior to this time. Physician response during disaster has become traditional. Careful planning, plus the fullest cooperation of all concerned, will result in an effort that will be monumental to the profession. Members of the dental and nursing professions are cooperating very well and will be of great assistance.

An over-all control headquarters must be established to coordinate the operations of the county and the several cities. Involved areas will need help, in the form of additional personnel, supplies and equipment. Undamaged areas will be called on to furnish these requirements in some cases and, in others, to receive casualty evacuees. Such shifting of personnel, supplies, equipment and casualties cannot be done in a haphazard manner. An over-all control authority is an absolute necessity. There must also be a central headquarters to assemble the data from various sources in order to arrive at a sound estimate of the situation in the entire community. On such an estimate must be based requests for aid from other cities, many of which will be a great distance from the attacked city. Again, the requests for aid will be for personnel, supplies and available hospital beds for the distant evacuation of casualties. Chart 3 shows the proposed organization of the master control center.

To man the master control center, it is estimated that approximately 67 persons wil be necessary, of whom 15 should be physicians and 52 nonmedical personnel. The total number includes the coordinator and his deputies, the executive officer and his deputies, section chiefs and deputies and other personnel, including telephone operators, message center supervisor, tabulation clerks, map plotters, clerk-typists for the various sections, a cook and an administrative nurse and dentist. The full time secretary of the county medical association civil defense committee is also included. The executive secretary of the county medical association will be one of the deputies to the chief of the personnel section. Pharmacists and clinic managers can be used to great advantage in practically all the nonprofessional sections.

It is our sincerest hope that the plans will never be used, but they must be drawn up in detail beforehand, and test runs must be conducted to prove the soundness of the planning and to correct any demonstrated deficiencies. All personnel must know what their jobs will be and thoroughly familiarize themselves with what will be required of them. This will require an extensive educational campaign that in itself will be a major undertaking. The public must also be educated, informed of what is expected of them and what is being done to take care of them. Panic must be avoided; otherwise the casualty lists will be greatly increased. An informed public is the best guarantee against panic. As so often is the case, the doctors must take the lead. We are confronted with a challenge that must be met, that will be accepted and will be accomplished with dispatch and efficiency.

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JAPANESE B ENCEPHALITIS IN KOREA

THE EPIDEMIC OF 1949

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An epidemic of Japanese B encephalitis occurred during the summer months of 1949 in Korea. The present report concerns epidemiological, clinical and etiological studies pertaining to this outbreak. Because of the general inaccessibility of previous Korean and Japanese reports, a review of such literature pertaining to prior occurrence of the disease in Korea appears desirable.

HISTORY OF PREVIOUS ENCEPHALITIS IN KOREA

There are no Public Health records concerning previous instances of Japanese B encephalitis in Korea, because Japanese health authorities did not require that this disease be reported, hence, the only available information on its appearance is in periodic medical publications in the Japanese or Korean language. Prior to 1933 several cases of "summer encephalitis" were reported,[1] but only a few are strongly suggestive of Japanese B encephalitis.

An outbreak of encephalitis in epidemic proportions occurred in Korea during the summer months of 1934 and 1935 with clinical observations being reported by

1. Konno, Y.: Two Cases of Lethargic Epidemic Encephalitis, Gun idan zassi **148**: 1293, 1925. Mizusima, H.; Im, M., and Sida, N.: Three Cases of Lethargic Encephalitis, Tyosen igaku-kai zassi **57**: 631, 1925. Iwai, S.: Lethargic Encephalitis, ibid. **78**: 538, 1927. Yosiwara, H.: On Epidemic Encephalitis Observed in Keijo (Seoul) This Summer, ibid. **22**: 1036, 1932. Takai, T.: On the So-Called Summer Encephalitis of Children, Zika zassi **404**: 93, 1934; Zyodai syomika zassi **1**: 21, 1933.

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Brig. Gen. W. L. Roberts, Commanding General, Korean Military Advisory Group; Capt. Frederick C. Goetz, Medical Corps, and Dr. Kee Yong Lee, Seoul National University, aided in making this investigation possible.

numerous workers.[2] The most detailed of these case reports was that published by Siiba and Chun,[2b] in which 23 cases with 14 deaths were described as occurring during August and September 1934. The onset of the disease was acute with headache and high fever. The sensorium was notably affected, and the patients at the height of the disease became comatose. Lethargy was not a common observation. Various neurological abnormalities were observed, but diplopia, nystagmus and ptosis of the eyelids were not prominent. Typical signs of meningeal irritation were demonstrable. The cerebrospinal fluid pressure was not increased. The fluid was clear to slightly turbid with moderate pleocytosis. Positive Nonne-Apelt reactions and negative bacteriologic cultures were recorded. The peripheral blood exhibited moderate leukocytosis. Herpes was not observed. Although no further etiological studies were attempted, the relatively uniform clinical picture together with the epidemic occurrence during summer months strongly suggested the likelihood of Japanese B encephalitis.

The official Korean Public Health records maintained by the existing Japanese government show a decided increase in meningococcic meningitis during September and October of 1924 and 1927 and again during August and September of 1934 and 1935.[3] In addition, the records of Seoul National University Hospital indicate the occurrence of 33 cases of a disease diagnosed as "summer encephalitis" during this same period of 1935. This accumulated evidence is strongly suggestive that the disease in question which occurred in Korea during the years 1924, 1927, 1934 and 1935 may well have been Japanese B encephalitis. At a later date (1938) one case was reported which was clinically indistinguishable to the observer from that of Japanese B encephalitis.[4] Again during the summer of 1939 a malady of epidemic proportions involving the central nervous system was observed and was described [5] as being similar to that reported in 1935.

Sabin and associates [6] observed four cases of Japanese B encephalitis during the summer of 1946 among American soldiers stationed in Southern Korea. A virus recovered from a patient who died was identified as that of Japanese B encephalitis. A specific diagnosis of the other nonfatal cases was accomplished by means of complement fixation tests. These data conclusively establish the presence of the virus of Japanese B encephalitis in Korea. During the autumn of 1946 serologic surveys of native Korean and of indigenous domestic animals were conducted in four different areas of Southern Korea. Neutralization tests on these serums indicated that the virus of Japanese B encephalitis was widely disseminated in that country.[7]

GENERAL ASPECTS OF THE 1949 EPIDEMIC

During the last week in August and the first week in September of 1949, an outbreak of a central nervous system disease originally considered meningococcic meningitis occurred in several small villages along the 38th parallel, chiefly northwest of Seoul. Investigators from the Ministry of Health studied the typical clinical picture, the character of spinal fluid cell counts, and negative spinal fluid cultures; recognition of the probable virus origin of the disease resulted. From that time on the epidemic was considered to be "summer encephalitis" or poliomyelitis. Concurrently radio broadcasts from North Korea warned the inhabitants of the spread of encephalitis in that area. No further confirmation could be obtained concerning a possible encephalitis epidemic north of the thirty-eight parallel.

The outbreak spread rapidly southward to Seoul, leading to a severe epidemic during the second and third weeks of September; it finally resulted in 1,283 reported cases. During the third and fourth weeks of September the disease spread radially from the Seoul area, resulting eventually in report of cases in all provinces with the exception of the Island of Cheju-Do. The case rate in these provinces varied inversely with the distance from Seoul (fig. 1). By the second week in October the epidemic had subsided except for a few isolated cases. Total cases reported as of October

Fig. 1.—Distribution and degree of incidence of Japanese B encephalitis in Southern Korea in 1949; morbidity per 100,000 population.

16 for the entire Republic of Korea were 5,548, with 2,429 deaths. Morbidity and fatality statistics by province are shown in table 1. The only unusual feature found on comparative review of climatic conditions during the past five years appears to be related to rain-

2. (*a*) Taketani, G.; Nakamura, K., and Rin, S.: On Epidemic Encephalitis Occurring in Keijo Area This Summer, Tokyo izi sinsi **2958**: 3088, 1935. Matuzaki, N.: Cases of Encephalitis Lethargica Observed in Seoul This Summer, Rinsyo naikagaku **3**: 382, 1933. (*b*) Siiba, Y., and Chun, C. H.: On Epidemic Encephalitis or So-Called Summer Encephalitis Occurring in Seoul Last Summer, J. mansen no ikai **180**: 1, 1935. (*c*) Yanagiwara, D.: Encephalitis Epidemic in P'yontaek District During the Summer of 1935, Rinsyo naikagaku **4**: 288, 1936.

3. Nakamura, K.: Considerations on Epidemiology of Summer Encephalitis in Korea, Naigai tiryo **11**: 811, 1936.

4. Tusima, K.: On Epidemic Encephalitis, Rinsyo naikagaku **6**: 308, 1938.

5. Iwai, S.: Acute Encephalitis, Rinsyo naikagaku **7**: 268, 1939. Hironaka, S.: Epidemic Encephalitis Occurring in Seoul in 1949, Zika zassi **46**: 109, 1940. Kin, Y.: On 11 Cases of Acute Encephalitis Hospitalized in This Clinic During the Summer of 1939, Rinsyo naikagaku **8**: 162, 1940.

6. Sabin, A. B.; Schlesinger, R. W.; Ginder, D. R., and Matumoto, M.: Japanese B Encephalitis in American Soldiers in Korea, Am. J. Hyg. **46**: 356-375, 1947.

7. Deuel, R. E.; Bawell, M. B.; Matumoto, M., and Sabin, A. B.: Status and Significance of Inapparent Infection with Virus of Japanese B Encephalitis in Korea and Okinawa in 1946, Am. J. Hyg. **51**: 13-20, 1950.

fall (fig. 2). The summer was classed as relatively devoid of the usual rainfall. Wind, humidity and temperature recordings showed little variation from the norm of preceding years.

CLINICAL OBSERVATIONS

Over 600 hospital charts were reviewed by one of us (Y. T. C.), and those that did not appear consistent with Japanese B encephalitis were discarded. The remaining 567 cases were used as a selected sample and formed the basis for the following remarks:

Age and Sex.—Case distribution by age is shown in figure 3. The age group from 3 to 13 years (2 to 12 years by American standards) constituted 63 per cent of cases, with four cases in the 1 year age group and 16 cases in patients 59 years of age and over. Of the 567 cases investigated, 57 per cent were in males. There appeared to be no predilection by sex for any given age group.

Symptoms.—In two thirds of the cases the onset was acute. Admission symptoms in diminishing order of frequency were as follows: fever (39 to 40 C.) 98 per cent; headache 92 per cent; anorexia 72 per cent; nuchal rigidity 72 per cent; nausea 60 per cent, and somnolence 58 per cent. During the period of hospitalization the outstanding abnormality recorded was a cloudy sensorium (69 per cent). Other prominent abnormalities included carpopedal spasm 44 per cent, partial or complete paralysis of extremity 20 per cent, bowel and/or bladder incontinence 24 per cent, strabismus 20 per cent, ptosis 8 per cent, facial palsy 5 per cent and hemiplegia 18 per cent. Some abnormality of deep or superficial reflexes was invariably present. Interference with deglutition, facial grimaces and tremor of tongue and fingers were also reported.

Hospitalization customarily lasted only through the period of most severe illness and averaged 12 to 14 days. Since almost all fluids for parenteral use are imported, fluid balance was frequently inadequately maintained; nursing care was often that afforded by members of the patient's family. The relatively low preexisting nutritional status of most patients is probably somewhat parallel to the situation often seen in Japan. These factors undoubtedly play a large part in the relatively high mortality rate recorded.

TABLE 1.—*Morbidity and Fatality Statistical Data for Japanese B Encephalitis South of the Thirty-Eighth Parallel, Korea, 1949*

Province	Population	Number of Cases	Morbidity	Number of Deaths	Case Fatality (%)
Kyonggi-Do*	2,733,944	2,521	92	1,152	46
Seoul City	1,437,670	1,283	89	475	37
Kangwon-Do	1,138,433	354	31	152	43
Chungchong-Namdo	2,026,837	423	21	208	48
Chungchong-Pukto	1,145,961	291	26	125	43
Kyongsang-Pukto	3,295,240	287	9	151	53
Cholla-Pukto	2,048,931	245	12	104	42
Cholla-Namdo	2,041,491	74	2	36	49
Kyongsang-Namdo	3,133,697	67	2	31	46
Cheju-Do	254,327	0	0	0	0
Total South Korea	20,166,556	5,548	27	2,429	44

* Morbidity per 100,000 population.

Maximum improvement in many instances had not been reached by the time of discharge, and the records accordingly reveal the following neurological residuals: mental deterioration 23 per cent; somnolence 11 per cent; tremor 9 per cent, and decerebrate rigidity 6 per cent. In addition, abnormal deep and/or superficial reflexes were still noted in 5 per cent of patients at this time. On the basis of their past experience the local physicians believed that continued improvement in most cases could be safely expected.

CLINICAL LABORATORY OBSERVATIONS

The principal observations routinely recorded pertain to the cerebrospinal fluid. The cell count was invariably elevated, showing an average total of 200 cells per cubic centimeter. Differential counts showed a predominant lymphocytic element, averaging 80 per cent. Spinal fluid chemical examinations were performed at a central laboratory of Seoul National University. Chlorides ranged from 320 to 473 mg. per 100 cc. (Mohr method, normal 450 to 500). Glucose was normal or moderately increased (Crecelius-Seifert method, normal 60 to 80 mg. per 100 cc.). Total proteins were invariably increased (Pandy). Calcium determinations by the Cart-Collip method frequently showed a reduction to 5 or 5.5 mg. per 100 cc. (normal 7 to 8 mg.).

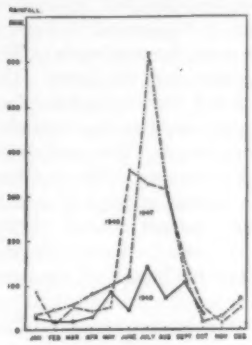

Figure 2.

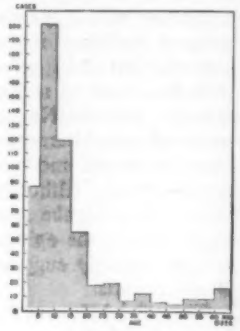

Figure 3.

Fig. 2.—Mean monthly rainfall, Seoul, Korea.

Fig. 3.—Japanese B encephalitis in Korea, 1949, showing age incidence in a breakdown of 567 cases.

PATHOLOGY

A limited amount of material was obtained for histologic review at this laboratory. A total of 24 slides included material from 10 autopsies. In one case there was a single section of cerebellum. In one other case a section of cerebellum and a section of caudate nucleus with internal capsule were examined. In three cases there were three slides, each of which included one slide of frontal or temporal cortex, one of thalamus or caudate nucleus and one of pons, substantia nigra or periaqueductal tissue.

Although these sections undoubtedly were selected for the degree of abnormality shown, consideration of the group as a whole shows a generalized distribution of focal glial nodules throughout the gray matter of the cortex, basal ganglions, brain stem, Purkinje layer and nuclei of the cerebellum. These focal areas are frequently associated with degenerating or necrotic ganglion cells. Such focal lesions in some instances show a sharply delimited area of encephalomalacia with early appearance of rod cells. Other apparently older lesions show dense collections of mononuclear cells, with a few polymorphonuclear leukocytes on occasion. Occasionally such nodules are seen in the deepest

layers of the cortex and in some instances in the immediately subjacent white matter. In the cerebellum they are localized chiefly in the Purkinje layer and in some instances are represented merely as focal proliferation in the Bergmann cell layer. The dentate nucleus of the cerebellum also shows the same lesion frequently. In the substantia nigra, the pontine nuclei and the olivary nuclei, these lesions are commonly seen. The thalamus and caudate nucleus are also frequently involved. In nine of the 10 cases studied some section of cerebral cortex other than motor area shows wide distribution of the same lesion. The leptomeninges on the whole show a moderate infiltration of the loose meshes with mononuclear and occasionally polymorphonuclear cells. Throughout areas of both gray and white matter there is the customary dense perivascular cuffing by round cells.

VIRUS ISOLATION

From 11 autopsied cases, seven virus isolates were obtained in the laboratory of Seoul National University. In one instance portions of the original material (case 1) were preserved in glycerin and sent to the 406th Medical General Laboratory, arriving two days later, on Sept. 9, 1949. After this material had been washed with sterile saline solution it was made into a 10 per cent emulsion with 10 per cent rabbit serum saline solution. After low speed centrifugation (2,000 revolutions per minute) in a refrigerated (International) centrifuge, 0.03 cc. of the supernate was inoculated intracerebrally and 0.1 cc. intraperitoneally into 2 week old Swiss mice. In addition, another group of albino suckling mice, 5 days old, was inoculated. After an incubation period of seven days in which none of the mice exhibited any symptoms of a virus infection, a blind passage was performed. In the second passage all mice, with the exception of two whose early death was apparently due to trauma, demonstrated typical symptoms of virus encephalitis. Additional passages were readily accomplished. This is shown diagrammatically in figure 4.

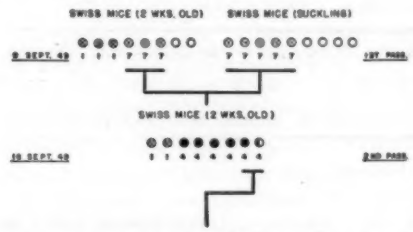

Fig. 4.—Virus isolate of case 1: solid circles, deaths; half-solid circles, encephalitic sacrifice; crossed circles, traumatic death or nonsymptomatic; open circles, survivals, and dotted circles, blind passage. Figures beneath the circles represent the days from inoculation to death.

Additional original human brain tissue preserved in glycerin was obtained from the laboratory of Seoul National University in each of the six other encephalitic cases. Attempts at isolation of the etiological agent from this material was begun on Nov. 4, 1949 in this laboratory with negative results. Our personal feeling is that the extended storage period may have been responsible for the failure to isolate the virus.

In addition, viruses isolated in Seoul from three patients (cases 1, 2 and 3) were obtained for further study in the Tokyo laboratory. On the basis of standard neutralization, complement fixation and cross resistance studies, it is revealed that virus isolates in cases 1, 2 and 3 were antigenically similar to, if not identical with, the Nakayama strain of Japanese B encephalitis virus (tables 2, 3 and 4).

TABLE 2.—*Identification of the Korean Isolates* as Japanese B Virus by Complement Fixation Test†*

Test	Immune Serum	Antigen‡	Dilutions of Serum 1:4	1:8	1:16	1:32	1:64	1:128	1:256
1	Jap. B virus	Case 1	4	4	4	4	4	±	0
	Guinea pig	Jap. B	4	4	4	4	4	3	0
	56 C. 20 min.	NMB	0	0	0	..	..	..	..
		Saline	0	..	..	..	..	..	..
	SLE	Case 1	4	4	2	0	0	0	0
	Mouse	SLE	4	4	4	4	4	4	±
	60 C. 20 min.	NMB	0	0	0	..	..	..	..
		Saline	0	..	..	..	..	..	..
	WEE	Case 1	1	±	0	0	0	0	0
	Guinea pig	WEE	4	4	4	4	4	4	4
	60 C. 20 min.	NMB	0	0	0	..	..	..	..
		Saline	0	..	..	..	..	..	..
2	Jap. B virus	Case 2	4	4	4	3	0	0	0
	Guinea pig	Case 3	4	4	4	3	0	0	0
	56 C. 20 min.	Jap. B	4	4	4	4	4	4	0
		NMB	0	0	0	..	..	..	..
		Saline	0	..	..	..	..	..	..
	SLE	Case 2	0	0	0	0	0	0	0
	Mouse	Case 3	0	0	0	0	0	0	0
	60 C. 20 min.	SLE	4	4	4	4	3	0	0
		NMB	0	0	0	..	..	..	..
		Saline	0	..	..	..	..	..	..
	WEE	Case 2	0	0	0	0	0	0	0
	Guinea pig	Case 3	0	0	0	0	0	0	0
	60 C. 20 min.	WEE	4	4	4	4	2	0	0
		NMB	0	0	0	..	..	..	..
		Saline	0	..	..	..	..	..	..

* Antigens of Korean isolates in cases 1, 2 and 3 were prepared from 17th, 14th and 16th passage materials, respectively.

† In the results of complement fixation tests shown for each dilution of serum, complement fixation is regarded as 4; different degrees of partial fixation as 3, 2 or 1; questionable trace as ±, and no fixation or complete hemolysis as 0.

‡ Jap. B denotes Japanese B encephalitis, Nakayama strain; SLE, St. Louis encephalitis; WEE, Western equine encephalomyelitis; NMB, normal mouse brain, and Saline, mixture with isotonic sodium chloride solution instead of antigen to check on anticomplementary properties of the serum.

SEROLOGIC STUDIES

Intracerebral neutralization and resistance tests were conducted in a manner identical to that described in a previous publication.[8] The technic for the complement fixation test was essentially similar to that employed by Casals and Palacios[9] with antigens of Japanese B (Nakayama strain), St. Louis and Western equine viruses being prepared by benzene extraction, according to the method described by Espana and Hammon.[10]

Inasmuch as paired serum specimens on individual cases were not obtainable, an attempt was made at collection of serum from a group of convalescent patients and from a corresponding number of apparently normal Koreans without clinical disease during the epidemic period. Serum was separated on the date of collection, stored at 4 C. and returned to Tokyo under refrigeration. On arrival in Tokyo serums

8. Burns, K. F.; Tigertt, W. D., and Matumoto, M.: Japanese Equine Encephalomyelitis: 1947 Epizootic; II. Serological and Etiological Studies, Am. J. Hyg. **50**: 27-45, 1949.

9. Casals, J., and Palacios, R.: The Complement Fixation Test in the Diagnosis of Virus Infections of the Central Nervous System, J. Exper. Med. **74**: 409-426, 1941.

10. Espana, C., and Hammon, W. McD.: An Improved Benzene Extracted Complement Fixing Antigen for Certain Neurotropic Viruses, Proc. Soc. Exper. Biol. & Med. **66**: 101-102, 1947; An Improved Benzene Extracted Complement Fixing Antigen Applied to the Diagnosis of the Arthropod-Borne Virus Encephalitides, J. Immunol. **59**: 31-44, 1948.

TABLE 3.—*Identification of the Korean Isolates* as Japanese B Virus by Cross Neutralization Tests†*

Immune Serum	Virus	Dilution of the Virus 10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	10^{-9}	—Log LD_{50}	Neutralization Log Index
Japanese B (Nakayama) Rabbit‡	Control	...	...	...	5/5	5/5	3/5	2/5	0/5	−7.5	...
	Jap. B ‡ (Nakayama)	5/5	2/5	0/5	1/5	0/5	...	...	...	−3.1	4.4
	Control	...	...	5/5	5/5	5/5	5/5	4/5	...	<−8.3	...
	Case 1, 19th pass	5/5	5/5	5/5	1/5	0/5	...	...	...	−4.7	>3.6
	Control	...	...	5/5	5/5	5/5	5/5	3/5	...	−8.1	...
	Case 2, 17th pass	5/5	5/5	5/5	4/5	1/4	...	...	...	−5.6	2.5
	Control	...	...	5/5	5/5	5/5	4/5	4/5	...	<−8.1	...
	Case 3, 15th pass	5/5	5/5	5/5	3/5	0/5	...	...	...	−5.1	>3.0
WEE ‡ Rabbit	Control	...	...	...	5/5	5/5	5/5	1/5	1/5	<−7.9	...
	WEE ‡	...	5/5	5/5	3/5	0/5	1/5	...	...	−5.3	>2.6
	Control	...	...	5/5	3/4	2/4	1/5	1/4	...	−6.3	...
	Case 1, 17th pass	...	...	5/5	3/5	1/5	0/5	0.5	...	−5.3	1.0
	Control	...	...	5/5	4/5	0/5	0/5	0/5	...	−5.3	...
	Case 2, 14 pass	...	...	4/5	2/5	1/5	0/4	0/5	...	−4.9	0.4
	Control	...	...	5/5	2/5	1/5	0/5	0/5	...	−5.1	...
	Case 3, 13th pass	...	...	5/5	4/4	1/5	0/5	0/5	...	−5.7	−0.6
SLE Rabbit	Control	...	...	5/5	5/5	4/5	0/4	0/5	...	−6.3	...
	SLE ‡	5/5	4/5	2/5	1/5	0/5	...	...	...	−3.9	2.4
	Control	...	...	5/5	5/5	5/5	5/5	4/5	...	<−8.3	...
	Case 1, 19th pass	...	...	5/5	5/5	3/5	1/5	2/4	...	<−6.8	1.5
	Control	...	...	5/5	5/5	5/5	5/5	3/5	...	<−8.1	...
	Case 2, 17th pass	...	...	5/5	5/5	5/5	1/5	1/5	...	<−6.9	1.2
	Control	...	...	5/5	5/5	5/5	4/5	4/5	...	<−8.1	...
	Case 3, 15th pass	...	...	5/5	5/5	5/5	4/5	2/5	...	<−7.7	0.4
EEE Rabbit	Control	...	...	...	5/5	5/5	4/5	2/5	0/5	−7.7	...
	EEE ‡	...	4/4	3/5	1/4	0/5	0/5	...	...	−4.4	3.3
	Control	...	...	5/5	3/4	2/4	1/5	1/4	...	−6.3	...
	Case 1, 17th pass	...	...	3/5	2/5	0/4	0/5	1/4	...	−4.8	1.5
	Control	...	...	5/5	4/5	0/5	0/5	0/5	...	−5.3	...
	Case 2, 14th pass	...	...	4/5	2/5	0/5	0/4	0/5	...	−4.7	0.6
	Control	...	...	5/5	2/5	1/5	0/5	0/5	...	−5.1	...
	Case 3, 13th pass	...	...	5/5	5/5	3/5	0/5	0/4	...	−6.1	−1.0

* Cases 1, 2 and 3.
† In the results of cross neutralization tests shown for each dilution of the virus the numerator denotes the number of mice which died, the denominator the number of mice inoculated. ‡ As in footnote ‡ to table 2.

TABLE 4.—*Cross Resistance Tests* in Mice with Korean Isolate (Case 1) and the Nakayama Strain of Japanese B Encephalitis*

Test	Vaccinated with	Challenged with	Dilution of Challenged Virus 10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	10^{-9}	—Log LD_{50}	Resistance Log Index
1	Japanese B Nakayama	Case 1 Jap. B	2/5	3/5	3/5	0/5	0/5	...	...	...	3.3	3.2
		Nakayama †	...	0/5	1/4	2/4	0/5	0/5	...	...	3.2	5.2
	Controls	Case 1 Jap. B	...	...	5/5	4/4	4/5	1/5	0/5	...	6.5	...
		Nakayama	...	...	...	5/5	5/5	5/5	4/5	1/5	8.5	...
2	Case 1	Case 1 Jap. B	5/5	2/4	1/4	0/4	0/4	...	...	...	3.3	4.0
		Nakayama	...	3/3	3/3	1/5	1/4	0/4	...	...	5.0	2.0
	Controls	Case 1 Jap. B	...	...	5/5	5/5	3/3	3/4	0/4	...	7.3	...
		Nakayama	...	...	...	5/5	4/5	2/4	1/5	0/4	7.0	...

* In the results of the cross resistance tests shown for each dilution of challenged virus the numerator denotes the number of mice which died, the denominator the number of mice inoculated. † As in footnote ‡ to table 2.

TABLE 5.—*Complement-Fixing and Neutralizing Antibodies in Normal Domestic Animals Indigenous to Korea*

Species	Date of Bleeding 1949	Complement Fixation * 0	1:4	1:8 or Over	Total	Neutralization † −	±	+	Total	Remarks
Chickens	11/ 1	3	0	0	3	2	0	0	2	Maintained as a flock in an American compound
	11/29	21	0	0	21	2	0	1	3	
Goats	11/ 4	3	0	0	21	3	0	0	3	Young adults
Cattle	11/ 4	3	0	0	3	0	0	3	3	Chung-Chong-Namdo
	12/ 1	25	0	0	25	0	7	15	22	7 miles from Seoul; 2 to 9 yr. old
	12/ 2	5	0	0	5	0	3	2	5	Seoul, 4 to 8 yr. old
Sheep	.....	3	2	0	5	1	0	4	5	Young adults
	12/ 3	16	0	0	16	3	6	7	16	3 yr. old
	12/ 3	4	0	0	4	3	0	1	4	1 yr. old
Horses	11/ 4	6	1	0	7	0	0	7	7	5 from Japan in 1948 or 1949, one 6 yr. ago
	12/ 3	20	5	1	26	0	0	23	23	Seoul, 2 to 15 yr. old
Swine	12/ 2	10	3	31	16	0	0	17	17	1 to 2 yr. old
Dogs	12/ 7	13	1	0	14	0	0	14	14	War dogs, 1 to 6 yr. old

* Here and in table 8, complement fixation with the Japanese B virus antigen in an original serum dilution of 1:4.
† Here and in table 8, results of neutralization tests are: positive, neutralization index 50 or greater; equivocal, neutralization index 10 to 49, and negative, neutralization index less than 10. ‡ One had a titer of 1:64.

were stored at —50 C. in a carbon dioxide chest until standard neutralization and complement fixation tests could be performed. In 4 of 18 serums collected from convalescent patients between the fifteenth and thirty-sixth day after onset of clinical disease, positive complement fixation results were obtained. Neutralization tests were positive in 12 of the 18 serums (table 6). Of 20 normal Koreans living in the Seoul area, one positive complement fixation test was obtained; of 19 neutralization tests done on this material, two gave equivocal titers and the other 17 showed a positive result (table 7).

Specimens were collected from numerous domestic animals in an attempt to determine serologic evidence of past experience with the virus of Japanese B encephalitis. During the preceding several years there had been a relatively large scale stock-importing program in Korea. It was found almost impossible, however, to obtain specific history with regard to arrival time of many of the animals tested. Cattle, sheep, horses and swine showed neutralizing antibodies in a high percentage of cases. One chicken showed a positive level of neutralizing antibodies. Two sheep, seven horses and six swine showed complement-fixing antibodies in a titer of 1:4 or higher (table 5).

TABLE 6.—*Complement-Fixing and Neutralizing Antibodies in Convalescent Serums of Korean Natives, 1949*

Case	Age	Sex	Onset of Illness	Days After Onset Specimens Obtained	Complement Fixation Titer	Neutralization Log Index
4	21	M	9/ 9	17	*	2.6
5	62	M	9/11	22	0	*
6	21	M	9/11	15	0	*
7	18	M	9/ 9	17	0	*
8	62	M	9/ 9	17	0	*
9	22	M	10/ 3	20	0	2.9
10	33	M	10/ 7	16	0	3.6
11	23	F	10/ 4	17	0	2.8
12	50	M	10/ 4	17	0	2.9
13	22	M	9/23	22	1:4 (3+)†	3.2
14	18	F	9/21	24	0	3.1
15	17	F	9/20	25	0	3.1
16	21	F	9/25	20	0	3.3
17	11	F	9/11	36	0	4.1
18	5	F	9/17	30	1:16 (4+)	>4.5
19	10	F	9/19	28	1:8 (3+)	*
20	8	F	9/14	33	1:8 (4+)	3.6
21	40	M	9/17	21	0	*

* Test not conducted. † See footnote † to table 2.

ANAMNESTIC REACTION IN KOREAN CHILDREN

Persons having past experience with virus of Japanese B encephalitis will frequently show only neutralizing antibodies on routine serologic surveys. As has been pointed out by Hammon [11] administration of a stimulating dose of Japanese B encephalitis virus vaccine, however, often acts as a recall stimulus and elicits complement-fixing antibodies. Accordingly, a group of 24 children from 4 to 15 years of age and 72 young adults between 17 and 31 years of age received 1 cc. of Japanese B encephalitis chick embryo vaccine. Blood specimens were taken at that time prior to immunization and again 10 days later. The prevaccination and postvaccination serums were simultaneously tested for neutralizing and complement-fixing antibodies. The pattern of increased complement-fixing and neutralizing antibodies in Korean persons elicited by the recall dose of vaccine is almost identical with what has been previously seen in the Japanese people with their high incidence of inapparent infection [12] (table 8).

COMMENT

Observations related to the epidemiology, symptomatology and pathology of fatal cases, in addition to the isolation of a filtrable agent identified antigenically as the virus of Japanese B encephalitis, indicate that the Korean epidemic during the summer months of 1949 was caused by the virus of Japanese B encephalitis. The inability to obtain an isolate on initial passage material in the 406th Laboratory raises the question of possible accidental contamination. However, the isolation of viruses in both laboratories from persons who died during the epidemic establishes the fact that Japanese B virus was present in human autopsy tissues in some instances.

TABLE 7.—*Complement-Fixing and Neutralizing Antibodies in Normal Serums of Native Koreans*

Case	Age	Sex	Length of Present Residence (Seoul)	Complement Fixation Titer	Neutralization Log Index
22	21	M	6 mo.	0	< 1.2
23	28	M	28 yr.	0	> 4.3
24	27	M	4 yr.	0	> 4.3
25	19	M	2 yr.	0	3.9
26	19	M	12 yr.	0	< 1.3
27	23	M	5 yr.	0	...
28	17	M	3 yr.	0	> 4.3
29	21	M	6 yr.	0	3.3
30	24	M	2 mo.	0	4.1
31	21	M	2 yr.	0	> 4.3
32	20	M	20 yr.	0	> 4.3
33	23	M	10 yr.	0	3.6
34	30	M	7 yr.	0	> 4.3
35	23	M	5 yr.	0	> 4.3
36	19	M	3 yr.	0	3.9
37	21	M	5 yr.	0	> 4.3
38	23	M	23 yr.	0	3.6
39	21	M	12 yr.	0	3.7
40	31	M	18 yr.	1:8 (3+)*	> 4.3
41	31	M	20 yr.	0	1.9

* See footnote † to tables 2 and 5.

TABLE 8.—*Serologic Response* of Korean Children and Young Adults to One Dose (1.0 Cc.) Each of Japanese B Chick Embryo Type Vaccine*

		Complement Fixation Test					Neutralization Test			
		0	1:4	1:8	1:16	Total	—	±	+	Total
Children	Prevacc....	24	0	0	0	24	11	2	5	18
	Postvacc...	17	1	1	0	19	2	2	7	11
Adults	Prevacc....	70	2	0	0	72	5	6	61	72
	Postvacc...	33	15	11	2	61	0	5	44	49

* Results of complement fixation and neutralization tests as indicated in footnotes to table 5.

The clinical picture is certainly compatible with the disease as seen in native populations in this area. The explosive nature of the epidemic is typical of our past experience with the same disease in Japan in recent years. Although the histological picture of virus

11. Hammon, W. McD.: Personal communication to the authors.

12. Sabin, A. B.; Ginder, D. R.; Matumoto, M., and Schlesinger, R. W.: Serological Response of Japanese Children and Old People to Japanese B Encephalitis Mouse Brain Vaccine, Proc. Soc. Exper. Biol. & Med. **65**: 135-140, 1947. Field Trial of Japanese B Encephalitis Vaccine in Okayama Prefecture, Annual Report, 406th Medical General Laboratory, Commission on Virus and Rickettsial Diseases, Army Epidemiological Board, Office of the Surgeon General, Department of the Army, Washington, D. C., 1948, pp. 18-151.

encephalitis is far from definite as regards the specific virus agent,[13] the diffuse nature of involvement in typical cases of Japanese B encephalitis can hardly be confused with any other virus infection of the central nervous system known to occur in this area.

A greater degree of serologic confirmation would have been desirable, but certain difficulties must be reported in this relation. Transportation limitations at the time of this field investigation prevented the regular and rapid shipment of specimens from Seoul to Tokyo. For this reason serums as collected were stored in the freezing compartment of a domestic refrigerator in Seoul until return to Tokyo could be effected. Unfortunately, local electrical power failures developed, and in many instances the electrical supply was interrupted for periods of three and four hours. The ability to demonstrate such antibodies in serums subjected to these variations in refrigeration must be taken as even stronger proof of the presence of Japanese B encephalitis virus. These factors may readily explain the relatively low incidence of complement-fixing antibodies in convalescent serums in comparison with data previously reported by Sabin and associates [14] and Hodes, Thomas and Peck.[15]

The transitory nature of complement-fixing antibodies in inapparent infections is rather widely accepted.[16] The presence of such antibodies in normal human beings and domestic animals suggests recent inapparent infections and indicates a relatively wide dissemination of virus during the summer of 1949. The high incidence of neutralizing antibodies in cattle, sheep, horses and swine corresponds to the results reported by Deuel and others.[7] An unusual result was noted in that one of five chickens had neutralizing antibodies. Results of neutralization tests reported up to this time on normal chicken serums have all been negative.[17]

It is noteworthy that a relatively high incidence of complement-fixing antibodies was observed among swine. Recently it has been found that the intrauterine infection of swine with the virus of Japanese B encephalitis causes stillbirths and premature deliveries of the young.[18]

13. Zimmerman, H. M.: The Pathology of Japanese B Encephalitis, Am. J. Path. **22**: 965-991 (Sept.) 1946. Haymaker, W., and Sabin, A. B.: Topographic Distribution of Lesions in Central Nervous System in Japanese B Encephalitis: Nature of Lesions; Report of Case on Okinawa, Arch. Neurol. & Psychiat. **57**: 673-692 (June) 1947. Olitsky, P. E., and Casals, J., in Rivers, T. M.: Viral and Rickettsial Diseases of Man, Philadelphia, J. B. Lippincott Company, 1948.

14. (*a*) Sabin, A. B.: Epidemic Encephalitis in Military Personnel: Isolation of Japanese B Virus on Okinawa in 1945; Serologic Diagnosis, Clinical Manifestations, Epidemiologic Aspects and Use of Mouse Brain Vaccine, J. A. M. A. **133**: 281-293 (Feb. 1) 1947. (*b*) Sabin, A. B.; Schlesinger, R. W., and Ginder, D. R.: Clinically Apparent and Inapparent Infection with Japanese B Encephalitis Virus in Shanghai and Tientsin, Proc. Soc. Exper. Biol. & Med. **65**: 183-187, 1947. Sabin, Schlesinger, Ginder and Matumoto.[6]

15. Hodes, H. L.; Thomas, L., and Peck, J. L.: Cause of an Outbreak of Encephalitis Established by Means of Complement Fixation Tests, Proc. Soc. Exper. Biol. & Med. **60**: 220-225, 1945.

16. Burns, K. F., and Matumoto, M.: Survey of Animals for Inapparent Infection with the Virus of Japanese B. Encephalitis, Am. J. Vet. Research **10**: 146-149, 1949. Burns, Tigertt and Matumoto.[6]

17. Arima, S.; Saito, K.; Takayama, Y.; Hironaka, N.; Ishii, K.; Honda, Y., and Kondo, K.: On Susceptibility of Japanese Wild Birds for Japanese B Encephalitis Virus, Japan. Med. J. **1**: 4 and 282-288, 1948. Deuell, Bawell, Matumoto and Sabin.[7] Sabin.[14a]

18. Burns, K. F.: Congenital Japanese B Encephalitis Infection of Swine, Proc. Soc. Exper. Biol. & Med. **75**: 621, 1950.

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SUMMARY

An epidemic of encephalitis occurred during the summer months of 1949 in Korea. Investigative results indicate that this outbreak was caused by the virus of Japanese B encephalitis.

1. The epidemic began during the latter part of August and lasted until the first week of October. A total of 5,548 cases were reported with 2,429 deaths.

2. A clinical entity consistent with Japanese B encephalitis was observed in patients during this epidemic.

3. Histological examination of tissue in several cases showed a diffuse nonpurulent encephalitis characteristic of Japanese B encephalitis.

4. A neurotropic virus was recovered from the brain in a fatal case. This agent and two others similarly obtained elsewhere were identified as the virus of Japanese B encephalitis.

5. Serologic comparison of normal and convalescent persons further supports the Japanese B encephalitis virus origin.

6. Serums of normal Koreans subjected to anamnestic evaluation and specimens from domestic animals indicate wide dissemination of the virus in Korea.

A STUDY OF NEUROPSYCHIATRIC REJECTEES

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During the war years, under the auspices of the National Research Council, Dr. Clements Fry [1] collected and studied data on the performance in the military service of men from Yale and Harvard universities who were treated for psychiatric difficulties while students at these institutions. The majority of these men served as officers. The diagnoses made while they were students included the gamut from psychoneurosis and sexual perversion to psychosis. These studies revealed considerable incongruity between predicted and actual failure rates in the military service. A great number who turned in creditable records would never have been recommended as acceptable for military service in the judgment of the psychiatrist who saw these men or surveyed their records.

As a result of our interest in "what happened to potential 'NP' failures inducted into the service" and in an effort to determine what could be expected of these men, a pilot study was made by us in 1945.

On request, Vice Admiral Ross T. McIntire, then Surgeon General of the Navy, furnished the types of discharges of 174 Navy personnel below the grade of commissioned officers who, prior to actual entrance into naval service, according to Selective Service records, had been rejected for a neuropsychiatric diagnosis on at least one occasion. Of this group, 11.5 per cent were given the following types of discharge:

(1) honorable, but with a neuropsychiatric diagnosis; (2) under honorable conditions ("unsuitability"), or (3) dishonorable. The remaining 88.5 per cent were honorably discharged or discharged for physical disabilities (non-neuropsychiatric) incurred while in the service.

These rather surprising findings stimulated further study on a larger scale: (1) to acquire information concerning actual performance of adjudged 100 per cent potential psychiatric failures in military service, and (2) to find, if possible, a common denominator which might be used to identify failures before induction. Motivating this was the desire to learn how man power can better be utilized in a time of all out emergency. It is a common belief that there was a great lack of proper man power utilization in World War II. Had the war been prolonged even a few months, there would have been few men to be called on for service under the standards existing then. High rejection rates for "mental disease," "mental deficiency" and "educational deficiency" have caused considerable ponderings, speculation and comment within and without the military service. These rates will be considered later in a discussion of the results of this study.

The national headquarters of the Selective Service System selected a sample consisting of 2,054 men who met four predetermined criteria. Each man embodied in the study (1) was rejected for military service for a neuropsychiatric diagnosis on at least one occasion; (2) was subsequently inducted into the Army; (3) served as an enlisted man, and (4) was discharged before the time of this study.

This sample was obtained by canvassing various state headquarters of Selective Service for the names of men meeting the first three criteria set out above. The state headquarters of Selective Service, in turn, canvassed their local boards by circular letter (table 1).

The sample may be criticized as not being purely random, and this is quite true. We can defend our sample only by admitting that it has certain deficiencies and that it was the best that could be obtained in the circumstances. In its behalf it may be said that subsequent statistical studies revealed that it closely follows the national pattern and that the race distribution approximates that in the United States as a whole.

Having obtained the names of persons meeting the criteria set out previously, three sources of information were utilized, as follows:

1. The Selective Service "cover sheet" or local board file of each man was obtained and abstracted for all medical and social history.

2. The Army service record or records, and allied material on file at the Discharged Personnel Records Branch of the Army, in St. Louis, were abstracted by Army medical officers kindly lent by the Research and Development Board of the Surgeon General's Office.

3. Medical and social surveys of the men, compiled prior to their entrance into the Army, were obtained where available.

Sources 1 and 2 were available for every man, and 3, the medical-social survey, was obtainable in 11 per cent of the cases. As compiled, the medical-social survey, when available, was of value in but a very few cases.

The data that were obtained on each person and placed on punch cards for tabulation purposes are shown in table 2.

Scrutiny of the data collected and indicated in table 2 for the 2,054 enlisted personnel permitted us to determine without exception a man's basic difficulty; for example, psychoneurotic disorder, character and behavior disorder, disorder of intelligence or psychotic disorder, regardless of whether the discharge was a Certificate of Disability discharge, was for inaptitude or lack of adaptability, dependency or surplus or was dishonorable. The data did not give a clue for a common criterion which might have been elicited at the time of examination for induction or enlistment and which would have predicted the failure of the person in the service.

Reason for and type of discharge proved to be the most accurate single criterion for judging a person's service to the Army. However, it, like any single factor, has its limitations. For example, we can demonstrate that some neuropsychiatric discharges in our study group, as well as in the Army as a whole, are the result of severe stress of combat, privation and fatigue and not necessarily psychiatric predisposition. Although we have a tendency to classify neuropsychiatric discharges as failures, this is not always true, for many men receiving such a discharge had performed well, received decorations and, from the standpoint of actual military service, were outstanding and successful soldiers.

Contrariwise, examination of our material revealed that a large number of the men receiving neuropsychiatric discharges were of no value to the military service at any time; they were, in fact, a liability. To further the difficulty of evaluation, and with all the data collected, we were aware that discharges on the grounds of "dependency" were not in every case bona fide. Men were relased on the grounds of "dependency" when these grounds were none too strong if they were not better than average or particularly desirable soldiers. Moreover, we know that all men discharged under "demobilization" were not soldiers of the same caliber or value to the service.

TABLE 1.—*States Represented in the Neuropsychiatric Study*

Alabama	Maryland	Oregon
Arkansas	Massachusetts	South Carolina
California	Minnesota	Texas
Colorado	Nebraska	Virginia
Kansas	New York	

TABLE 2.—*Data Collected*

State	Induction and discharge dates
Race	Type of induction
Age	Stress period
Marital status	Months of military service
Dependency	Overseas service
Education	Character of service
Literacy test score	Discharge rank
Civilian occupation	Decorations
Military occupation	Military hospitalization and diagnosis
Civilian court record	Discharge type and reason
Military court record	
Original disqualifying neuropsychiatric data	"Performance" score

Dr. Clements C. Fry [2] has aptly pointed out that whether a man turns in a maximum or a minimum job performance in a time of national emergency, he nevertheless has performed a service which has a face value. This fact is well borne out in the case of a few men in the study who were borderline mental deficients, with Army General Classification Test scores well below 70. These men served well from 20 to 32 months. During the hostilities they were utilized as truck drivers and for other allied, but essential, services rather than as combat soldiers. After the war they enlisted in the Regular Army, only to be discharged later because of "lack of adaptability" (AR 615-369), for in the post-war man power economy they were not of sufficient value to be retained in service. Throughout this paper we are concerned only with man power utilization in times of all out national emergency, which is quite different from man power consideration in partial mobilization or in peacetime.

When the data were analyzed on the basis of "reason for discharge" stated on Army separation forms, we found that 20.6 per cent of our sample were discharged because of a neuropsychiatric disorder. Each of these 424 represents an error in medical judgment at the time of induction. Further analysis is shown in table 3.

TABLE 3.—*Reason for Discharge of 2,054 Men*

Reason	No.	%
Psychoneurotic disorder	166	8.1
Character and behavior disorder	111	5.4
Disorder of intelligence	116	5.6
Psychotic disorder	31	1.5
Total	424	20.6
Certificate of disability; non-neuropsychiatric disorder; killed in action	177	8.6
Demobilization	881	42.9
Expiration of enlistment	245	11.9
Dependency	187	9.1
Surplus; miscellaneous	140	6.9
Total	1,630	79.4

This 20.6 per cent neuropsychiatric separation rate gives rise to the next question: What is the neuropsychiatric separation rate for all enlisted men of the Army covering the same period?

The Army does not tabulate men as individuals but as discharges. For example, if a man is inducted and later desires to enlist, he is discharged to enlist and then receives another discharge at the expiration of his enlistment. Thus, one person may have two discharges recorded in over-all Army records. A parallel situation exists in one group of 2,054 men. When the discharges are tabulated, we find that 330 men were discharged to enlist; thus, the sample represents 2,384 discharges. If we follow the same procedure in finding our percentages as is followed by the Army, using the 2,384 discharges rather than the 2,054 men, we find that the incidence of neuropsychiatric discharges to all discharges was 17.8 per cent. Thus we note that the over-all rate for the potential failure group (approximately 18 per cent) is only three times as great as that of the entire Army, which is 6 per cent. Table 4 shows the incidence of enlisted men discharged on this basis for psychoneurosis and psychosis. It is interesting that the percentage of discharges for true psychosis is so nearly the same for the Army as for the study group that it is statistically insignificant.

To study this group further, a scoring system was devised in which five factors were considered, as follows: (1) reason for discharge; (2) length of service; (3) service rating at discharge; (4) court martial, and (5) rank at time of discharge.

TABLE 4.—*Incidence of Enlisted Men Discharged for Specific Causes from 1942 to 1946 Computed on Total Number of Discharges*

Cause	Incidence, %
All Neuropsychiatric Discharges	
Army of the United States *	6.0
Study group	17.8
Psychoneurosis †	
Army of the United States *	2.8
Study group	7.0
Psychosis	
Army of the United States *	1.3
Study group	1.5

* All enlisted men.
† The United States Army figure represents only Certificate of Disability discharges, while the study group figure represents Certificate of Disability discharges and others in which psychoneurosis was the actual underlying basis for discharge as determined by the examination of Army records.

Reason for Discharge: Men discharged for neuropsychiatric reasons received 0 for this factor; those discharged for such reasons as "dependency," "surplus," and being fathers, received a score of 1; those killed in action, dying in service or receiving a Certificate of Disability for physical disease (service incurred) and those discharged under demobilization received a score of 2.

Length of Service: A man serving for less than six months received a score of 0; six to 12 months, 1; over 12 to 18 months, 2, and 18 months or over, 3.

Service Rating: A service record rating of "unsatisfactory" at discharge received a 0; "satisfactory," 1; "good," 2, and "excellent," 3.

Courts Martial: With three or more courts martial the person received a score of 0; with two, a score of 1; with one, a score of 2, and with none, a score of 3.

TABLE 5.—*Results of Scoring System in Neuropsychiatric Study*

Score	No.	%	Mo. Served, Average	Service Rating
0-5	461	22.4	6.7	Unsatisfactory
6-9	560	27.3	14.1	Average
10-14	1,033	50.3	20.0	Above average to excellent

Rank at Time of Discharge: A rank of private or private first class at discharge received a score of 0; corporal or "buck" sergeant, a score of 1; technical sergeant or higher (excluding first or master sergeants), a score of 2, and first or master sergeant, a score of 3.

It is seen that the highest possible score was 14 and the lowest 0. Results of this scoring are shown in table 5. It is apparent from this scoring that the neuropsychiatric failure rate in a group of 100 per cent potential neuropsychiatric failures is, roughly, from 20 to 25 per cent.

2. Fry, C. C., and Rostow, E. G.: Reflections on the Problem of Psychoneuroses, Interim Report to the Committee on Medical Research, Office of Scientific Research and Development, October 1945.

It is of interest that the difference between the number of men (461) shown as unsatisfactory in table 5, with a percentage of 22.4 of the whole group, is not significantly different from the number actually discharged because of neuropsychiatric disorders as shown in table 3.

Over-all rejection rate estimates for military service, for the period of November 1940 to August 1945, are now available, and it is estimated that 17,954,500 men were examined and 6,419,700 were rejected. This gives a rejection rate of 35.8 per cent.

On the basis of the most reliable figures Selective Service has gathered,[3] constituting a 20 per cent sample of the total number of men aged 18 to 44 at the time of examination (November 1940 through December 1944), 11.1 per cent were rejected for general service primarily because of "mental and educational deficiency" and "mental disease." Through the application of this percentage, obtained from the 17,954,500 men, to the men examined through August 1945, it is estimated that 1,992,950 men were rejected for general service for neuropsychiatric diagnoses.

CONCLUSIONS AND INTERPRETATIONS

Two thousand and fifty-four men originally rejected for neuropsychiatric reasons later served, with the result that 79.4 per cent, or 1,630 of the total, rendered satisfactory service. This would indicate that of the 1,992,950 men rejected because of "mental and educational deficiency" and "neuropsychiatric conditions" a large number could have served profitably in some capacity and would have been discharged honorably and without a neuropsychiatric disability.

For a future emergency mobilization, the methods of the past, wherein the examination of a prospective recruit resulted merely in a cataloging of physical attributes, must be revised and some method devised whereby the examination may reflect the recruit's ability to serve. This may be accomplished, at least in part, by perfection of the profile system presently in use. However, no common criterion was found in the present study that could be used in the examination of men to identify in advance those unable to serve creditably.

Because of the lack of personnel and time, the neuropsychiatric examination, as it was carried out as a part of the process of examining men, was fair to neither the examiner nor the examinee. Some other method must be devised. A definite effort may be made by the Selective Service System to establish, at local board level, a registrant's successes and failures as he has reacted to civil life, and unless he is definitely psychotic or psychoneurotic to such an extent that he has not been able to adjust to civil life he should be inducted. Within the armed forces a determination may be made, under observation, regarding his usefulness. If it is determined that he cannot be used profitably, he should be discharged with no obligation to the government because of so-called possible aggravation.

Selective Service System, Washington 25, D. C.

TREATMENT OF HEMOPHILUS INFLUENZAE MENINGITIS WITH CHLORAMPHENICOL AND OTHER ANTIBIOTICS

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There is abundant experimental evidence supporting the high degree of action which sulfadiazine, streptomycin and hyperimmune rabbit serum manifest against Hemophilus influenzae.[1] Moreover, it has been shown that combinations of these agents have provided the best results in the treatment of meningitis caused by this gram-negative bacillus. Improvement has been apparent from the point of view of reduction of fatality and morbidity, in addition to lessening the complications resulting from this virulent form of meningitis in children.

We have become increasingly interested in single forms of therapy with the newer antibiotics in acute microbial infections for several reasons: 1. Their range of activity is wider, leading to fewer superinfections. 2. They provide a simple therapeutic regimen. 3. The therapeutic action on the causative organism and the striking clinical improvement have been of sufficient degree to render it unnecessary to employ supplemental agents. 4. The problem of bacterial resistance has been insignificant. 5. There is a need for compiling clearcut data in order to determine the ideal therapeutic regimen. In following this course we have been guided by frequent clinical and bacteriologic evaluations of the patients.

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3. Periodic Reports of Physical Examination, November 1940-December 1944, Washington, D. C., Selective Service System, vol. 4.

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Drs. Albert M. Powell and David Josephs, of Mercy Hospital, Baltimore, aided in this study. Miss Audrey Funk contributed technical assistance. Members of the pediatric staff, University Hospital, aided in the clinical management of the patients.

This study is one of a group supported by a grant to the Section of Infectious Diseases, Department of Medicine, University of Maryland, from Parke, Davis & Company, Detroit; McCormick and Company, Incorporated, Baltimore, and the Commission on Immunization of the Armed Forces, Epidemiological Board, Washington, D. C.

1. (*a*) Litman, S. N.; Buckley, R. P., and Wells, A. H.: Influenzal Meningitis, Minnesota Med. **30**: 647, 1947. (*b*) Birmingham, J. P.; Lay, R., and Smith, M.: Streptomycin in the Treatment of Influenzal Meningitis, J. Pediat. **29**: 1, 1946. (*c*) Hoyne, A. L.; Brown, R. H., and Drucker, A. P.: Influenzal Meningitis Treated with Streptomycin, Arch. Pediat. **63**: 559, 1946. (*d*) McMorrow, K. H.; Top, F.: Treatment of Hemophilus Influenzae b Meningitis, Pediatrics **5**: 452, 1950. (*e*) Alexander, H., and Leidy, G.: The Present Status of Treatment for Influenzal Meningitis, Am. J. Med. **2**:457, 1947. (*f*) Crook, W. G.; Clanton, B. R., and Hodes, H. L.: Hemophilus Influenzae Meningitis, Pediatrics **4**: 643, 1949.

After appropriate laboratory studies, we employed aureomycin therapy in a number of children with influenzal meningitis.[2] The results were quite satisfactory. Additional publications by others have described the favorable results with the use of aureomycin in this disease.[3]

Chloramphenicol, another Streptomyces-derived antibiotic of extreme versatility, has now been successfully employed in the treatment of 12 patients with H. influenzae meningitis. Accordingly, this report presents the clinical results and describes our laboratory findings with aureomycin, chloramphenicol, streptomycin and terramycin in experimental H. influenzae mouse infections.

EXPERIMENTAL STUDIES IN MICE

Methods.—Test organisms employed were meningeal strains of H. influenzae, type b, which had recently been isolated from human patients with meningitis. After identification, stock cultures were maintained in both Fildes agar and Fildes broth.

Comparative in Vitro Sensitivity of Hemophilus Influenzae to Various Antibiotics

Strain Number	Chloromycetin M. E. C.*	Aureomycin M. E. C.	Streptomycin M. E. C.	Penicillin M. E. C.
1	0.75	0.9	3.9	0.9
2	0.75	1.9	3.9	0.9
3	1.5	1.9	3.9	1.9
4	3.12	0.9	7.8	1.9
5	0.4	0.4	0.8	1.7
6	1.7	0.4	1.7	0.8
7	0.4	0.4	1.7	1.7
8	5.0	5.0	5.0	2.5
8A †	0.8	10.0	5.0	2.5
9	1.7	1.7	5.0	1.7
10	1.7	0.4	0.8	0.8
10A ‡	5.0	2.5	10.0	1.7
10B §	1.7	0.8	5.0	1.7
	Terramycin			
11	2.5	2.5	5.0	10.0
12	1.7	0.4	1.7	10.0
13	1.7	1.7	5.0	6.0
14	1.7	0.8	5.0	6.0

* Minimum effective concentration, micrograms per cubic centimeter of medium in vitro.
† 8A, strain isolated from elbow in case 8.
‡ 10A, strain isolated during first relapse in case 10.
§ 10B, strain isolated during second relapse in case 10.

Tests for in Vitro Sensitivity: Tests for the in vitro sensitivity of the organisms were performed by inoculating 5 cc. of Fildes broth, containing varying concentrations of antibiotic, with 0.1 cc. of a 12 hour culture of H. influenzae. The bacterial suspension was then incubated under reduced oxygen tension at 37 C. and the result expressed with use of the 100 per cent endpoint technic.

Animal Studies: Female Swiss albino mice ranging in weight from 15 to 20 Gm. were used in the protection studies. The infectious inoculum, administered intraperitoneally, consisted of a 0.25 cc. suspension of H. influenzae of varying dilutions and 0.75 cc. of a 5 per cent suspension of gastric mucin. Suspensions of test organisms were prepared by washing a 10 hour growth on Fildes agar with isotonic sodium chloride solution or by concentration of the growth in a liquid medium. The number in the 1 : 10,000,000 dilution varied from 800 to 5,000 organisms per cubic centimeter. The mice were examined hourly, and H. influenzae, type b, were demonstrated in the heart blood and peritoneal exudate from the majority of the dying mice.

Antibiotics [4] were administered subcutaneously at six hour intervals in the following doses: streptomycin, 0.25 mg.; aureomycin, 0.25 mg.; chloramphenicol, 0.50 mg.; penicillin, 0.20 mg., and terramycin, 0.50 mg. per dose. Therapy was started within three to four hours after inoculation of the infected material. Treatment was continued for approximately 60 hours, at which time no more deaths occurred among the control animals and treated animals were obviously improved.

Experimental Results.—The therapeutic effectiveness of the various agents varied but slightly in the three protection studies. The protection afforded by chloramphenicol ranged from 100,000 to 30,000,000 $L.D._{50}$. Aureomycin and streptomycin protected 50 per cent of the animals against 300,000 to 30,000,000 $L.D._{50}$. Terramycin protected against 1,000,000 $L.D._{50}$. Penicillin was devoid of significant effect in all cases. The 50 per cent endpoint varied from $10^{-6.3}$ to $10^{-7.5}$ as calculated by the Reed-Meunch formula.

In the table are given the results of in vitro sensitivity tests performed on organisms isolated from the spinal fluid of the patients studied. In 10 strains so tested, aureomycin and chloramphenicol were slightly more effective than streptomycin. Terramycin, a newly described Streptomyces-derived antibiotic, inhibits H. influenzae in concentrations ranging form 0.4 to 1.7 gamma per cubic centimeter. We performed in vitro sensitivity tests to penicillin, and the results compare favorably with previous findings of Hodes [1f] and Pittman.[5]

In summary, we found aureomycin and streptomycin equally effective in the chemotherapy of H. influenzae infections in mice. Protection afforded by chloramphenicol, although slightly less, was nevertheless significant.

CHLORAMPHENICOL IN H. INFLUENZAE MENINGITIS

With the knowledge of the foregoing experimental data, we used chloramphenicol to treat 12 patients with influenzal meningitis.

Selection of Cases.—This group of 12 patients was unselected and comprised patients admitted to the hospital with signs of acute meningitis. The ages ranged from 5 months to 5 years, with a mean of 2.4 years. Eight were 18 months or less and five less than 1 year of age. There were seven boys and five girls. Two of the children were severely ill and five critically ill, as judged by the clinical condition and spinal fluid findings.

Diagnostic Criteria.—The diagnosis of meningitis, after observation of the usual signs, was confirmed by immediate examination of the spinal fluid. Leukocyte counts and determination of the glucose concentration were immediately performed. The sediment obtained after centrifugation was examined for bacteria, with use of Gram's technic, and cultures were made on Fildes agar. The bacteria isolated in each instance were identified by use of type-specific serums, in addition to the determination of their X and Y growth factor requirements. The spinal fluid of each patient was examined frequently as a guide to the therapeutic response. Blood and pharyngeal cultures, blood leukocyte counts and urinalyses were routinely performed.

Method of Therapy.—All 12 patients received chloramphenicol orally, with an initial dose of 750 mg. and subsequent doses of 250 mg. every four hours. It was necessary to administer chloramphenicol rectally in several instances. A rectal dose of 500 mg. was given every four hours as a supplemental measure to replace the antibiotic lost by intermittent vomiting. Concen-

2. Drake, M. E.; Bradley, J. E.; Imburg, J.; McCrumb, F. R., and Woodward, T. E.: Aureomycin in the Treatment of Influenzal Meningitis, J. A. M. A. **142**: 463 (Feb. 18) 1950.

3. Chandler, C., and Hodes, H. L.: Aureomycin in the Treatment of Experimental and Clinical Infections with H. influenzae, Type B, Pediat. **5**:267, 1950.

4. The aureomycin was supplied by the Lederle Laboratories Division, American Cyanamid Company, Pearl River, N. Y. Terramycin was supplied by Chas. Pfizer & Company, Inc., Brooklyn.

5. Hewitt, W. L., and Pittman, M.: Antibacterial Action of Penicillin, Penicillin X and Streptomycin on Hemophilus Influenzae, Pub. Health Rep. **61**: 768, 1948.

tration of chloramphenicol was determined on specimens of blood serum and spinal fluid throughout the period of study by a method previously described.[6] Eight of the patients had received penicillin prior to admission. Over 1,000,000 units had been given in two cases, without improvement. One patient (case 4) received terramycin prior to the administration of chloramphenicol.

Clinical Results.—Irrespective of the severity of the disease or the age of the patient, the clinical response was rapid in 12 patients treated with chloramphenicol. Improvement of the clinical condition was apparent within 36 hours, and signs of meningeal irritation, such as stiff neck and positive Kernig's sign, had abated by the fifth day of treatment. The mean duration of fever after institution of specific therapy was 2.3 days.

The 12 patients received chloramphenicol for a mean period of 8.0 days. The total amount of antibiotic administered averaged 10.4 Gm.

Laboratory Results.—Detailed laboratory findings accompany the case records that follow. In 11 of the 12 patients gram-negative pleomorphic organisms were detected on direct examination of the cerebrospinal fluid. After 12 hours' incubation, organisms identified as H. influenzae, type b, were isolated from all patients. Blood cultures were positive for H. influenzae in seven of 10 cases studied. Spinal fluid cultures became negative under chloramphenicol therapy in 48 hours in eight instances.

Initial spinal fluid glucose levels ranged from 4 to 54 mg. per 100 cc., with a mean of 23.4 mg. The significance of this determination, often regarded as a valuable guide to the severity of illness and effect of therapy, was difficult to evaluate because the intravenous administration of dextrose was uniformly employed. Nevertheless, there was a steady daily rise of the spinal fluid sugar which usually coincided with a favorable clinical response.

Levels of chloramphenicol in the blood ranged from 5 to 50 micrograms per cubic centimeter. Concentrations found in the spinal fluid were somewhat less and averaged 5 to 25 micrograms per cubic centimeter, with a mean value of 10 micrograms.

Occurrence of Complications.—The recovery of 10 of these patients was uncomplicated. At the time of discharge none of the 10 showed signs of central nervous system derangement, and electroencephalographic tracings of three of the severely ill patients studied were normal.

One of the two remaining patients was treated initially with aureomycin in ordinarily effective doses, but H. influenzae reappeared in the spinal fluid while this antibiotic was being administered. Cultures became immediately sterile after chloramphenicol administration. Neurological examination revealed left upper extremity and facial paresis. An electroencephalogram demonstrated a right cortical focus, and several days later the patient experienced a return of symptoms, with a positive spinal fluid culture. Chloramphenicol was again employed and resulted in complete abatement of signs and symptoms after six additional days of therapy. The patient on discharge was perfectly well, and a subsequent electroencephalogram was normal.

The second patient, whose case is recorded in detail later (case 4), was hospitalized late in the first week of disease. Terramycin therapy for four days failed to diminish the number of bacteria in the spinal fluid, and the patient showed evidence of extensive cortical damage. After 36 hours of treatment with chloramphenicol, the spinal fluid was sterile.

Bacterial resistance to chloramphenicol has not been encountered to date. In none of these cases did extrameningeal complications occur after treatment was instituted. Of the 12 cases, 11 recovered completely without residua (91.6 per cent), and there were no fatalities.

ILLUSTRATIVE CASES

CASE 1 *(chart 1).*—The patient was a white boy aged 13 months, in whom a high temperature and vomiting developed five days prior to admission. Penicillin (300,000 units) had been previously administered. Two days later there was a temperature of 103 F., nuchal rigidity and lethargy. A lumbar puncture revealed grossly cloudy fluid which contained 12,000 white blood cells per cubic millimeter. The patient was transferred to the University Hospital, where examination revealed marked

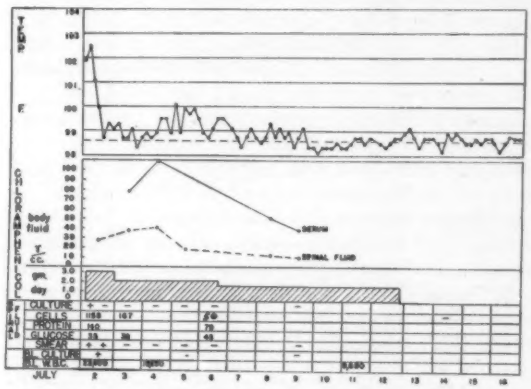

Chart 1 (case 1).—Chloramphenicol in the treatment of H. influenzae meningitis in a 13 month old boy; weight, 25 pounds (11.3 Kg.).

rigidity of the neck, extreme irritability and a temperature of 102 F. The spinal fluid contained 1,100 leukocytes and numerous gram-negative pleomorphic bacteria which were isolated culturally and identified as H. influenzae, type b.

Chloramphenicol treatment was instituted with an initial dose of 750 mg. followed by 500 mg. doses every six hours for a period of 3.5 days. The patient then received 500 mg. at eight hour intervals for six days, for a total of 19.9 Gm. given over a period of 10.5 days. The clinical response to treatment was striking, as manifested by complete abatement of the meningeal irritation within 48 hours after the start of chloramphenicol therapy. There was rapid improvement of the sensorium, and the child was afebrile in 48 hours. The course thereafter was uneventful until discharge, on the fifteenth hospital day. Recovery was complete. It is possible that penicillin had effected some improvement in this case.

Laboratory Data.—Spinal fluid and blood cultures were sterile after 18 hours of treatment and remained sterile thereafter. Pharyngeal cultures, positive for H. influenzae on admission, revealed predominantly Staphylococcus albus on discharge. Chloramphenicol levels of the blood and spinal fluid are presented graphically along with other relevant findings in chart 1.

6. Smith, R. M.; Joslyn, D. A.; Gruhzit, O. M.; McLean, J. W., Jr.; Penner, M. A., and Ehrlich, J.: Chloromycetin: Biological Studies, J. Bact. 55: 425, 1948.

CASE 2 *(chart 2)*.—The patient, a Negro boy aged 5 years, was admitted to the University Hospital with the complaint of fever, headache and stupor of about 12 hours' duration. The initial temperature was 101 F. Physical examination revealed a well nourished and stuporous child. He responded only to painful stimuli, and there was deviation of both eyes to the left. There was marked nuchal rigidity, and Kernig's and Brudzinski's signs were positive. Deep reflexes were hypoactive. The remainder of the physical examination was noncontributory.

Lumbar puncture revealed cloudy fluid which contained 2,800 leukocytes. Spinal fluid glucose was 8 mg. per 100 cc. Gram-negative bacilli were found by direct examination, and subsequent culture produced a heavy growth of H. influenzae, type b.

Gastric intubation was performed, and the patient received 750 mg. of chloramphenicol followed by 250 mg. at four hour intervals. The total dose was 9.75 Gm. administered over a period of six days.

There was marked improvement in the sensorium, and signs of meningeal irritation were largely abated in 24 hours and absent in 48 hours. The temperature returned to normal after four days of specific treatment. The patient was discharged without residua on his forty-sixth hospital day. Although he was fully recovered, the child remained in the hospital because of a persistent pleocytosis of about 50 cells per cubic millimeter.

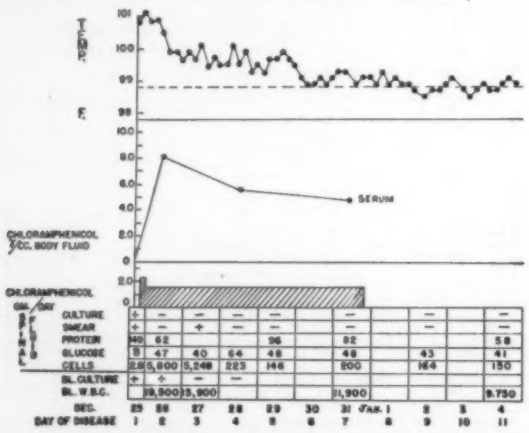

Chart 2 (case 2).—Chloramphenicol treatment of H. influenzae meningitis in a 5 year old boy weighing 36 pounds (16.5 Kg.). Moderate pleocytosis persisted in spite of early recovery.

Laboratory Data.—Cultures of the spinal fluid became sterile after 24 hours of specific treatment, and the white blood cell count ranged from 2,800 to 5,800 during the acute phase. H. influenzae was isolated from both the blood and the pharynx prior to treatment. The bacteremia rapidly disappeared, and pharyngeal cultures were free of H. influenzae. An electroencephalogram performed during the recovery period was normal.

CASE 3 *(chart 3)*.—In this patient, an 18 month old Negro boy, there developed pyrexia and convulsions 36 hours prior to admission. Pneumonitis was first suspected, and for this the patient received 300,000 units of penicillin. The fever continued, and 30 hours later the child was extremely irritable. There was persistent vomiting and marked rigidity of the neck. The temperature was 101.8 F. Initial spinal puncture revealed grossly cloudy fluid which contained 5,900 leukocytes. Direct examination of the spinal fluid revealed numerous gram-negative pleomorphic bacilli which were identified as H. influenzae, type b. A dose of 750 mg. of chloramphenicol was given orally, followed by 250 mg. doses at four hour intevals. During the first 24 hours improvement was definite but not striking. After 48 hours of specific treatment there was noticeable improvement of the sensorium. In three days the mental state was better and the neck was completely flexible. The temperature remained elevated for four days after the beginning of treatment. The patient received 9.75 Gm. of the antibiotic over a period of six days. After seven days the patient was asymptomatic and remained so thereafter.

Laboratory Data.—Spinal fluid cultures were negative after 18 hours of specific treatment. The glucose concentration was 9 mg. per 100 cc. on the first examination and rose to 16 mg. per 100 cc. in 24 hours. It was normal in 40 hours. The spinal fluid leukocyte count ranged from 4,000 to 11,000 during the early phase of illness. Blood and pharyngeal cultures

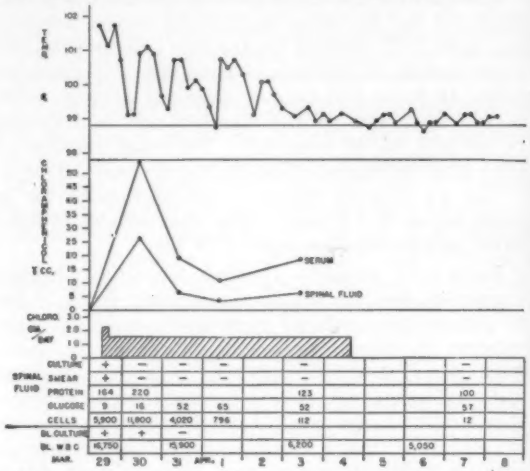

Chart 3 (case 3).—Course of disease in an 18 month old boy weighing 23 pounds (10.5 Kg.) who was severely ill with H. influenzae meningitis. Treatment with chloramphenicol was started on the second day of disease. Recovery was uncomplicated.

were initially positive for H. influenzae, and subsequent cultures were free of this organism. An electroencephalogram at the time of discharge was normal.

CASE 4 *(chart 4)*.—The patient, an 11 month old Puerto Rican infant, was admitted to the Bayamon District Hospital, San Juan, Puerto Rico, because of fever and irritability of about seven days' duration. Penicillin had been administered prior

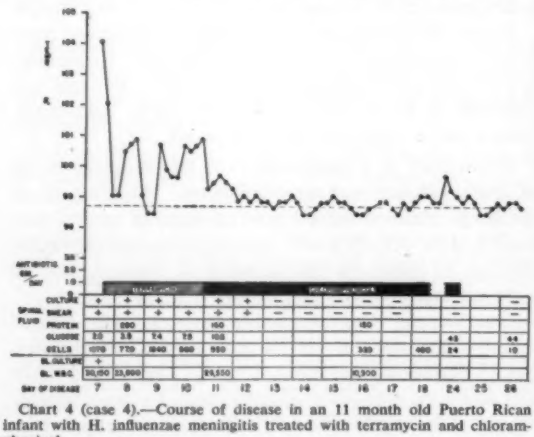

Chart 4 (case 4).—Course of disease in an 11 month old Puerto Rican infant with H. influenzae meningitis treated with terramycin and chloramphenicol.

to entry into the hospital. When first examined the skin was hot and dry, and the neck was moderately rigid. Reflexes were active. The spinal fluid was cloudy and contained 1,070 white blood cells, which were predominantly polymorphonuclear in type. The spinal fluid dextrose was 2 mg. per 100 cc. Direct examination of the spinal fluid revealed gram-negative organisms that were identified as H. influenzae, type b.

Terramycin was administered on the day of admission (seventh day). An initial dose of 500 mg. was given orally, fol-

lowed by doses of 250 mg. every six hours for four days. The temperature response was striking, as may be noted in chart 4, and within 24 hours the child had improved, as manifested by clearing of the sensorium and increased flexibility of the neck. Both the smears and the cultures of the spinal fluid remained positive for H. influenzae, and after four days of terramycin treatment there was continued evidence of disease, i. e., the presence of nuchal rigidity and tremor of the left arm and leg. Because of the persistent positive spinal fluid cultures, terramycin was discontinued on the eleventh day of disease, and chloramphenicol therapy instituted, with an initial dose of 500 mg. and subsequent doses of 250 mg. every six hours. Within 36 hours cultures of the spinal fluid were sterile, and gram-negative organisms were no longer visualized. The spinal fluid cleared gradually but was not entirely free of cells until the thirty-seventh day of disease. Four days after the institution of chloramphenicol therapy, the signs of meningeal irritation were largely alleviated and the temperature continued on a normal course. The mental state did not completely clear; the child reached an impasse characterized by lethargy, slight spasticity and irritability. Facilities for additional study, including electroencephalograms, were unavailable, and it has been surmised that arachnoiditis developed. From a bacteriologic aspect, it appeared that chloramphenicol was of greater value than terramycin, although the latter antibiotic did improve the clinical condition.

COMMENT

The mortality rate in influenzal meningitis in infants prior to the use of sulfonamides exceeded 95 per cent. Although sulfadiazine was of some value, Alexander [10] concluded that in few cases could treatment be successful with this drug alone. In a series of 90 patients treated with type-specific antiserum in combination with sulfadiazine, 80 per cent of the patients recovered.[7] Streptomycin was early demonstrated to be effective in vitro and in vivo against H. influenzae. The use of this antibiotic as the sole form of therapy in influenzal meningitis resulted in ultimate recovery in approximately 66 per cent of 12 children so treated.[8] Alexander [10] then advocated the treatment of severely and moderately ill patients with a combination of sulfadiazine, antiserum and streptomycin. Of 25 patients so treated, 19 recovered completely, three recovered with residua and three died. Streptomycin-resistant strains of H. influenzae were demonstrated in two of the fatal cases. Recently Hodes and his associates [1f] treated 49 patients with the triad of drugs mentioned above, noting complete recovery in 65 per cent, a fatality rate of 16 per cent and recovery with residuals in 19 per cent.

Both Hodes [1f] and Pittman [5] have determined that penicillin exerts significant in vitro activity against H. influenzae, and the latter investigator has reported favorable in vivo effects. The strains of bacteria tested by us in mice exhibited no significant sensitivity to penicillin in the doses employed. Furthermore, in eight of the 12 patients treated successfully with chloramphenicol, penicillin had first been administered, a procedure which had not resulted in clinical or bacteriologic cure. It seems extremely unlikely that penicillin will find use in the therapy of influenzal meningitis.

Recently our group reported the favorable effect of aureomycin in seven patients with influenzal meningitis. Other reports [2] have appeared which confirm that a single antibiotic significantly controls this form of meningitis in infants.

Our delay in employing chloramphenicol in patients with H. influenzae meningitis was due to the weight of experimental evidence slightly favoring aureomycin. As determined by in vitro testing, the various strains of H. influenzae, type b, tested were slightly more sensitive to aureomycin than to chloramphenicol. Furthermore, in experimental mouse infections a greater degree of protection was afforded by aureomycin, although chloramphenicol protected infected animals significantly. We have recently observed, moreover, the fallacy of transposing experimental results in mice to anticipated human response. It has been particularly noted in tularemia that chloramphencol is relatively ineffectual in protecting mice inoculated with Pasteurella tularensis. By contrast, in human tularemia there is very striking benefit.[9] The rapidly accumulating background of experience tends to favor chloramphenicol as the antibotic of major importance in combating the group of infections caused by gram-negaitve organisms.

In these 12 children aged 5 months to 5 years, mean age 2.4 years, the average duration of fever after institution of therapy was 2.3 days. There was rapid improvement of the clinical condition with return of the sensorium in 1.3 days. There were no fatalities. One of these 12 patients has shown neurological residua, and it is to be emphasized that treatment in this patient was instituted on the seventh day of disease.

Chloramphenicol was administered by the oral and rectal routes. The mean value for duration of treatment in these 12 patients was 8.0 days, and the amount of antibiotic administered was 10.4 Gm. Chloramphenicol treatment presented no real problem from the point of view of administration. Five patients received the antibiotic by gavage. Blood and spinal fluid concentrations of chloramphenicol were determined, although it is to be emphasized that the knowledge of these results came after recovery had ensued and did not serve as a guide to therapy. The concentration of chloramphenicol in the spinal fluid of five patients tested on four different occasions averaged 13.2 micrograms per cubic centimeter, which was roughly half the blood level. We do not have sufficient data to recommend an optimal level to be attained. Toxic manifestations referable to hematological and renal functions were not observed.

Obviously, these results obtained with chloramphenicol need amplification in a larger series of patients before comparison with other forms of therapy is justified. The data obtained in these 12 patients invite further evaluation of chloramphenicol in the treatment of this virulent form of meningitis, and it is hoped that single therapy will be employed in larger numbers of cases. We now have data on the use of chloramphenicol for other forms of bacterial meningitis which extend the range of this antibiotic even more.[10] Chloramphenicol lends itself aptly to clinical testing because of the relative ease of administration, lack of toxicity and

7. Alexander, H. E.: Treatment of Type b Hemophilus Influenzae Meningitis, J. Pediat. 25:517, 1944.

8. Alexander, H. E.; Leidy, G.; Rake, G., and Donovick, R.: Hemophilus Influenzae Meningitis Treated with Streptomycin, J. A. M. A. 132: 434 (Oct. 26) 1946.

9. Parker, R. T.; Lister, L. M.; Bauer, R. E.; Hall, H. E., and Woodward, T. E.: The Use of Chloramphenicol in Experimental and Human Tularemia, J. A. M. A. 143:7 (May 6) 1950.

10. To be published.

the stability of the compound, which makes bioassay in various tissue fluids a relatively simple procedure.

In the age group from 1 to 5 years, an initial oral dose of approximately 750 mg. is sufficient, and subsequent doses of 250 mg. every four hours will maintain an adequate blood and spinal fluid concentration. Rectal administration of 500 mg. will aid in enhancing the orally administered drug. An intravenous form of chloramphenicol would be of extreme value for use in early acute stages of disease. The optimal course of therapy is not yet known.

In one of the cases (case 4) terramycin was first employed as the therapeutic agent. After four days of treatment, cultures of the cerebrospinal fluid remained positive and became negative about 36 hours after chloramphenicol had been administered. We have had no further experience with terramycin in treatment of H. influenzae infections and can form no conclusions from this limited experience, although it is known that terramycin diffuses slowly into the cerebrospinal fluid.[11]

CONCLUSIONS

Chloramphenicol exerts significant in vitro and in vivo effects against H. influenzae. The experimental results obtained with aureomycin and streptomycin were slightly better. Terramycin has likewise been found to show similar protection in mice.

Twelve children with H. influenzae meningitis were successfully treated with chloramphenicol. The clinical response to treatment was striking. There were no fatalities.

ACTIVATION OF PEPTIC ULCER DURING PITUITARY ADRENOCORTICOTROPIC HORMONE THERAPY

REPORT OF THREE CASES

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In their review of treatment with pituitary adrenocorticotropic hormone (ACTH), Thorn and his coauthors,[1] referring to a personal communication from Spiro, state that "although definitive studies have not yet been completed, the clinical impression seems to have been gained that ACTH administration may aggravate the symptoms of peptic ulcer." In the Armour pamphlet[2] on the hormone (1950) it is stated: "Patients with duodenal and gastric ulcers studied to date have done poorly on ACTH. We do not recommend it in any case having a duodenal or gastric ulcer."

I have observed three cases in which there was a recurrence of a peptic ulcer during treatment with pituitary adrenocorticotropic hormone, out of a group of 79 cases in which the hormone was used for varying conditions at the Passavant Memorial Hospital. I have been able to find only two previously reported cases in which there was activation of a peptic ulcer during treatment with the hormone. The first of these was reported by Beck and his associates[3] to draw attention to the obscuring effect of the drug on certain clinical evidences of peritonitis. The patient was a 34 year old woman with periarteritis nodosa who had a previous history of postprandial epigastric fulness and cramping pain. However, a gastrointestinal roentgenogram taken two years before admission disclosed no abnormalities, and the diagnosis of "nervous stomach" had been made. After seven days of therapy with pituitary adrenocorticotropic hormone, in doses of 100 mg. a day, abdominal pain developed. Twenty-seven hours later, although the symptoms were atypical (owing to the absence of muscular rigidity, temperature elevation and leukocytosis), laparotomy was performed and a perforation 4 mm. in diameter was found in what appeared to be an acute ulcer on the anterior wall of the first portion of the duodenum. There was generalized peritonitis. The therapy was continued postoperatively in doses that did not exceed 80 mg. a day, and the course was uneventful. The authors of this paper stated only that the relation between the perforation of an acute ulcer and the administration of the drug was not certain.

The second case was reported by Habif, Hare and Glaser.[4] The patient was a 54 year old white woman who was given pituitary adrenocorticotropic hormone for the treatment of amyotrophic lateral sclerosis. There were no previous gastrointestinal complaints. The hormone was given for 29 days over a 36 day period, 80 mg. a day, with a rest period of seven days after an initial 15 days of administration. Nine hours after cessation of the hormone therapy severe abdominal pain suddenly developed. In this case, as in the first case reviewed, the diagnosis was somewhat confused, owing to "the striking picture of well-being as to color, temperature and blood pressure." However, examination revealed a boardlike abdomen with pronounced rebound tenderness, and roentgenograms subsequently disclosed free air under the diaphragm. Improvement was rapid with medical management alone. A week after the onset of the pain, a gastrointestinal roentgenogram demonstrated a deformed duodenal bulb with a deep ulcer crater.

The Passavant Memorial Hospital case reports follow:

CASE 1.—E. T., a 55 year old advertising executive, entered the hospital on Feb. 10, 1950 for the treatment of a chronic lesion of lupus erythematosus involving his face and neck. The lesion had been present about 10 years and had gradually progressed in size and prominence, despite many different forms of therapy administered by a number of dermatologists. Initially, gold compounds had been used with some success, but this therapy had to be discontinued when toxic reactions developed. There was never any evidence of a disseminated form of the disease. Two years before admission the patient was hospitalized because of localized peritonitis due to rupture of the appendix. Nine months later he had a recurrence of

11. Herrell, W. F.; Heilman, F. R.; Wellman, W. E., and Bartholomew, L. G.: Terramycin: Some Pharmacologic and Clinical Observations, Proc. Mayo Clin. 25:183, 1950.

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Dr. Howard Alt, associate professor of medicine, Northwestern University, advised me in the preparation of this paper.

1. Thorn, G. W., and others: Medical Progress: The Clinical Usefulness of ACTH and Cortisone, New England J. Med. 242:824, 1950.

2. ACTH, Chicago, Armour Laboratories, 1950, p. 52.

3. Beck, J. C.; Browne, J. S. L.; Johnson, L. G.; Kennedy, B. J., and MacKenzie, D. W.: Occurrence of Peritonitis During ACTH Administration, Canad. M. A. J. 62:423, 1950.

4. Habif, D. V.; Hare, C. C., and Glaser, G. H.: Perforated Duodenal Ulcer Associated with Pituitary Adrenocorticotropic Hormone (ACTH) Therapy, J. A. M. A. 144:996 (Nov. 18) 1950.

appendicitis and at this time underwent an operation. Prolonged postoperative debility followed, and since that time the patient had never been well. He complained of weakness and unsteady gait. There were several hospitalizations for study, and the diagnoses of melancholia and early arteriosclerotic paralysis agitans were made. It was believed that the unsightliness of the lupus lesions contributed to his depression, and for this reason pituitary adrenocorticotropic hormone was given.

The patient was known to have had a duodenal ulcer since 1929 and three separate episodes of bleeding with melena and hematemesis (1929, 1933 and 1941). Since 1941, however, he had had no significant symptoms and followed no particular regimen save for mild dietary restrictions. A roentgenogram of his stomach had not been taken since 1941. At that time a constant filling defect was described in the duodenum. The patient had elevated blood pressure for a number of years, and there was roentgenologic and electrocardiographic evidence of cardiac enlargement.

On examination, the blood pressure was 180/100, pulse rate 104 and temperature 98.6 F. The lesion was described as three well demarcated erythematous patches on the right side of the patient's face and neck. The largest of these covered most of the face, and in its center was a black scaling encrustation. There were no other remarkable findings. The blood cell count, hemoglobin and urine were normal. The eosinophil response to 0.5 mg. of epinephrine was tested, and in four hours a decrease from 44 to 11 cells per cubic millimeter was recorded. On the seventh hospital day the use of pituitary adrenocorticotropic hormone in doses of 25 mg. every eight hours was started. After three days of therapy (total dosage, 225 mg.), a definite paleness of the erythema of the lesion was noted and separation of the black encrustation from the skin in the center of the lesion began. On the twelfth hospital day, after five days of therapy (total dosage, 375 mg.), while returning from the bathroom at 1:30 a. m., the patient suddenly experienced a sharp stabbing pain in the right upper quadrant of the abdomen. The blood pressure was 220/110, temperature 98.6 F., pulse rate 90 and white blood cell count 10,200. A scout roentgenogram of the abdomen showed a collection of encapsulated fluid with a level anteriorly beneath the right side of the diaphragm. There was an irregular patch of increased density in the right lung above this area. Hormone therapy was discontinued immediately. The use of antibiotics, continuous gastric suction and parenteral administration of fluids was started. There was less pain the next morning, although the rigidity and tenderness were still considerable. The temperature remained normal, and the white blood cell count was only 4,650. On the thirteenth hospital day there was still less pain, but the patient had become lethargic. There was some rigidity in the right upper quadrant, and no bowel sounds could be heard. The rectal temperature had risen only to 100.2 F., the white blood cell count was 6,600 and the blood pressure was 118/92. The patient continued to become weaker, and by the fourteenth day his rectal temperature had risen to 101 F. He had passed very little urine since the onset of the pain, and there was a complete anuria for about 48 hours before he died, on Feb. 24, 1950, his fifteenth hospital day. Daily white blood cell counts were taken until his death, but the highest of these was only 10,800.

At autopsy, about 1,000 cc. of a thick dark green fluid was found in the abdomen. The peritoneum, both visceral and parietal, was covered with a thick serofibrinous green material. The stomach contained a small amount of green-white fluid, and the rugal folds were hypertrophied and hyperemic. One centimeter distal to the pylorus on the anterior surface of the duodenum, there was a rounded area of perforation with a smooth border, measuring 0.8 cm. in diameter. The perforation was located over the site of an acute and chronic ulceration. The remainder of the gastrointestinal tract was slightly hyperemic but otherwise grossly normal. Microscopic section disclosed necrosis of the adjacent duodenal tissue from the serosa to the mucosa, with an accompanying acute and chronic inflammatory reaction. The remainder of the gastrointestinal tract had normal muscularis and mucosa, with an acute serosal inflammatory reaction.

In the attempt to demonstrate a definite relation between the aggravation or activation of a preexisting peptic ulcer and the administration of pituitary adrenocorticotropic hormone, this case contributes the strongest evidence of the three presented here, because of the long interval (nine years) between the time of the patient's last ulcer symptoms and the acute perforation. Thus the possibility of a purely circumstantial relationship in this case seems remote. As in the two previously reported cases that have been reviewed, the delay in diagnosis, due to the observation of relatively low temperature and the lack of leukocyte response in the presence of peritonitis, contributed to the death of the patient. In contradistinction to the condition in Beck's case, however, abdominal muscular rigidity was present.

CASE 2.—R. L., a 52 year old white man, entered the hospital on June 12, 1950 for a treatment of a generalized disfiguring psoriasis, which had been present for about five years. The onset of the skin condition was associated with an episode of inflammatory reaction about several joints, which was diagnosed as acute rheumatoid arthritis. After about five months the joint involvement subsided, so that only minimal disability was caused. However, the psoriasis continued, and in the last two or three months before admission it had become very severe. The patient had a duodenal ulcer in 1919. He had three moderately severe hemorrhages, and in 1921 a gastroenterostomy was performed. He was then free of symptoms until 1927, when he again had a gastric hemorrhage, and between 1927 and 1937 there were three more episodes of bleeding. From 1927 to 1938 he was free of ulcer symptoms except after dietary indiscretions, when there were transient mild "gas pains." In 1948 there was another episode of melena without ulcer pain, which lasted only a few days. This seemed to be associated with nervous strain due to a new business enterprise.

In January 1949, the patient was again admitted to the hospital, because of a substernal aching of three weeks' duration. He was seen in consultation by a cardiologist, who did not consider the pain to be of cardiac origin. A stomach roentgenogram revealed a questionable marginal ulcer at the stoma site, as well as a marked deformity of the duodenal bulb. No crater was seen. The pain disappeared during hospitalization, before treatment for the ulcer was instituted. The patient followed an ulcer regimen for a short time after this but then disregarded treatment. He came to the hospital again, in December 1949, because of melena, which had been present for five days. There were no associated symptoms, and with management of the ulcer, the stools rapidly became negative for blood. On May 12, 1950, when the patient returned for the treatment of the psoriasis with pituitary adrenocorticotropic hormone, he admitted having disregarded the ulcer regimen after his discharge from the hospital and stated he had not had ulcer symptoms in the interim. A roentgenogram again disclosed the duodenal deformity, and this time a crater and spasm in the bulb were demonstrated. Most of the barium went through the normal tract rather than through the enterostomy tract. Treatment with pituitary adrenocorticotropic hormone was begun on May 16, with 20 mg. every six hours for seven days. The doses were then reduced to 20 mg. every eight hours, and finally on June 2, after 10 days of this amount, they were further reduced to 20 mg. a day. This schedule was continued until the patient's discharge on June 5. The total dosage during this hospitalization was 1.220 Gm. During the course of therapy the skin lesions faded but did not disappear. The patient felt fine and had not yet complained. There were no dietary restrictions except for the limitation of sodium to 700 mg. a day. Following discharge and cessation of therapy the psoriasis returned, even worse than before treatment, and the arthritis, which had been quiescent, now began to bother him.

The patient returned June 29, 1950 for more hormone therapy, complaining of listnessness and poor appetite for 10 days preceding admission but not mentioning ulcer symptoms.

The blood pressure was 116/90 and the pulse rate 80. Large and small scaling brittle lesions of psoriasis were generalized over the entire body but particularly involved the face and scalp. There was moderate tenderness and pain on motion of the right shoulder, elbow and wrist and also of the left knee and ankle. However, there was no evidence of ankylosis of any of these joints. The red blood cell count was 4,750,000, the hemoglobin value 14.6 Gm. and the white blood cell count 7,250. The sedimentation rate (Wintrobe) was 42 mm. an hour.

The patient was again given a salt-free general diet, and administration of pituitary adrenocorticotropic hormone was begun on July 1 in doses of 20 mg. every six hours. The arthritic symptoms improved, but the psoriasis remained the same. On July 13, the doses of the hormone were increased to 50 mg. every six hours; this led to definite improvement of the psoriasis. The patient had no symptoms referable to the ulcer until July 22, when, after a total dose of 2.84 Gm. with this course, he complained of the rather sudden onset of epigastric distress, weakness, rapid pulse and perspiration. Several hours later, he had a black tarry stool, which was positive for blood by the guaiac test. Ulcer management was instituted, and the next day, July 23, the dose of the hormone was reduced to 50 mg. every eight hours. The blood pressure on July 23 was recorded once as 80/50 and once as 102/60, but the patient was otherwise comparatively asymptomatic. He had one more black stool positive for blood on July 23, but the next stool, on July 24, was of normal color and contained no blood. The blood pressure on July 24 was 112/70, red blood cell count 3,640,000, hemoglobin value 13 Gm. and white blood cell count 10,250. On July 31, the dose of the drug was further reduced to 25 mg. every eight hours and after that to 25 mg. every 12 hours. Treatment for the ulcer was continued, and there were no further ulcer symptoms. During this hospitalization the patient received a total of 4.975 Gm. of pituitary adrenocorticotropic hormone. He was discharged on August 14, on a dosage schedule of 25 mg. a day, to be followed as an outpatient.

It is possible that the relation in case 2 between the administration of pituitary adrenocorticotropic hormone and the hemorrhage may be circumstantial. There was an interval of six months between the time of the patient's last ulcer symptoms and the acute hemorrhage, but a stomach roentgenogram in May 1950, just before the first course of hormone therapy, showed a deformed bulb with a crater and spasm. It should be noted that the activation occurred only with a dosage much higher than is now usually recommended and that, while the patient was under treatment for ulcer, therapy with a still relatively high dosage was continued without untoward effect.

CASE 3.—C. S., a 33 year old white man, entered the hospital on July 27, 1950, with a diffuse skin disease that had been diagnosed elsewhere as mycosis fungoides. The patient had had moderately advanced psoriasis since the age of 3 years, but in October 1949 the lesions began to assume the characteristics of the ulcerated infiltrated plaques typical of mycosis fungoides. The diagnosis of this had been confirmed by biopsy. There was little response of the lesions to roentgen treatment and use of nitrogen mustard, but marked remission of the lesions had been effected by ultraviolet ray therapy. Since March 1950, the skin lesions had become worse and the patient had had a dry, hacking cough, lost 30 pounds (13.6 Kg.) and had a daily temperature of 100 to 101 F. The patient had had "indigestion," an uncomfortable sensation in the epigastrium, for about three years. For five months previous to admission the pain had been severer and had changed in that almost all foods except milk caused an accentuation of the pain within half an hour after eating. Sodium bicarbonate, which previously had given relief, was no longer effective. Because of the pain, the patient had used a bland diet for several months prior to entry. He had never had gastrointestinal roentgenograms taken, nor had he previously sought medical attention for the "indigestion."

The typical infiltrated plaques of mycosis fungoides were scattered over the entire body, and there were numerous other lesions grossly characteristic of psoriasis. The uninvolved skin was deeply pigmented. The abdomen was normal except for slight tenderness in the epigastrium on deep pressure. There was no lymphadenopathy, and the chest was clear on percussion and auscultation. The blood cell count, urine, thrombocytes and bone marrow were normal. The sedimentation rate (Wintrobe) was 40 mm. in one hour; blood urea nitrogen, 11.4 mg., and total proteins, 6.46 mg. per 100 cc. The stools were repeatedly negative for blood. Fractional gastric analysis revealed no free acid in the fasting specimen; after an alcohol test meal free acid rose to a peak of 80 units at 45 minutes. A chest roentgenogram on admission showed a faint shadow in the left second interspace, but several days later stereoscopic studies disclosed small rounded parenchymal infiltrates scattered through both lung fields. A skin biopsy of a typical lesion confirmed the diagnosis of mycosis fungoides. Results of the Robinson-Kepler-Power test were negative for evidence of adrenal insufficiency. A stomach roentgenogram revealed a cryptlike defect, 1 cm. in diameter, on the lesser curvature of the body of the stomach, with large folds radiating from it. This was interpreted as a penetrating gastric ulcer. There was no four hour retention.

For several days after admission the patient complained increasingly of epigastric distress. Then he was given treatment for ulcer, resulting in immediate relief. However, when roentgenograms were again taken, on Aug. 22, 1950 (after 16 days of treatment), the ulcer crater was still present, although smaller than at the time of the first examination. The patient had negligible distress during this period. At this time a chest roentgenogram was taken and a considerable increase in the pulmonary lesions was demonstrated. Therapy with pituitary adrenocorticotropic hormone, 100 mg. a day in four divided doses, was begun on August 24. The temperature immediately dropped to normal from a previous daily elevation since admission of 100 to 101 F. The pretreatment eosinophil level on August 24 was 199.8 per cubic milimeter. When the test was repeated, on August 26, the level was 122.1 per cubic millimeter.

Two days after the institution of hormone therapy the patient began to notice a slight epigastric aching, and suddenly on August 27, after a total dose of 400 mg. of the drug, he was stricken with a sharp excruciating pain in the epigastrium, which caused him to cry out and assume a hyperflexed position. The pain radiated directly into the back, but there was no shoulder pain. He complained of dyspnea when supine and stated that the pain was worse with deep respirations. His temperature rose to 103 F.; the pulse rate was 104, and respiratory rate, 25 to 30. The physical examination revealed no evidence of shock or cyanosis. The chest was clear, and the heart tones were normal. The abdomen was flat, with definite localized epigastric tenderness and rigidity. The bowel sounds were quiet. The white blood cell count was 11,500, red blood cell count 4,220,000 and hemoglobin value 13. Serum amylase during an episode of acute pain was 51 units per 100 cc. A scout roentgenogram of the abdomen did not demonstrate free air. During the next several days the guaiac test revealed no blood in stools. The hormone therapy was stopped immediately, and hourly feedings and antacids were given. The intense pain gradually subsided, but the patient remained uncomfortable with epigastric aching for about a week. The pain was only temporarily relieved by antacids. On August 28 the eosinophil level was 166 per cubic millimeter.

Two weeks after the cessation of hormone therapy the patient was having only minimal distress. He was given in succession over a three week period two treatments with radioactive phosphorous, a course of nitrogen mustard and, finally, ultraviolet ray therapy. There was improvement of his general condition and remission of his pulmonary lesions.

Thirty-nine days after the cessation of hormone therapy, the patient no longer had any ulcer symptoms and was given cortisone, 50 mg. daily, with gradual increases to a maximum of 200 mg. daily after 12 days. He received the latter doses for three days. In all, a total dosage of 1.22 Gm. was given. The eosinophil level on the first day of treatment was 122.1 per cubic millimeter. It was rechecked only once, after seven days of therapy, when it was recorded as 99.9 per cubic millimeter. There was some improvement of the skin lesions during the course but no aggravation of the ulcer symptoms. On completion of the therapy a stomach roentgenogram failed to disclose the ulcer previously seen.

The short period between the control of the ulcer symptoms and the roentgenologic discovery of a deep crater formation just before the pituitary adrenocorticotropic hormone was given makes it more difficult to rule out the circumstantial factor in this than in either of the other two cases presented. However, the severity of the recurrence of symptoms was unusual for even a large gastric ulcer under therapy, and it would seem that the pituitary adrenocorticotropic hormone was responsible.

In this patient there was no masking of the diagnosis, in that both muscular rigidity and temperature elevation were prominent. However, the white blood cell count rose to only 11,500.

COMMENT

Results of recent experimental studies may possibly explain the deleterious effect of pituitary adrenocorticotropic hormone on peptic ulcer. The first of these is the work of Spiro, Reifenstein and Gray [5] concerning the effect of the hormone on uropepsin excretion. This proteolytic enzyme, which is normally present in the urine, is generally considered to reflect the peptic activity of the stomach. Available evidence suggests that it is derived from the secretion of pepsinogen into the blood stream by the gastric glands. These authors noted an immediate increase of this substance following the administration of pituitary adrenocorticotropic hormone, with a gradual fall to normal on cessation of therapy. Although uropepsin is clinically and physiologically distinct from gastric juice pepsin, these authors found a parallel rise of the latter substance with administration of the hormone in one patient. Patients with active peptic ulcers often have relatively high levels of uropepsin excretion, and in one patient studied by these workers a control level of 6,000 units (compared with the normal of 2,000 units) rose to "the unprecedented level of 16,000 units" with use of the hormone.

The second line of investigation is the effect of pituitary adrenocorticotropic hormone depression of the growth of granulations in wounds. This was first noted by Ragan [6] in the wound healing of patients with rheumatoid arthritis under treatment with the hormone. Subsequently several investigators [7] have demonstrated a depression of all the elements of granulation tissue—fibroblasts, blood vessels and ground substance—in experimentally produced wounds in animals given cortisone. These studies covered various lesions, including skin defects, fractures and incised wounds of the skin and stomach. Although this effect on wound healing was noted to be similar to that of scurvy, the ascorbic acid (vitamin C) levels in these animals were not significantly depressed. In another experiment repeat biopsies of incised wounds in humans receiving pituitary adrenocorticotropic hormone disclosed no healing of the mesenchymal tissues one week after the wound was incurred. Since the healing of a peptic ulcer is dependent on healthy granulation tissue at the base of the ulcer, it is conceivable that the action of the hormone could depress ulcer healing in a similar manner.

I have been unable to find any statements in the literature regarding the effect of cortisone on peptic ulcer activity. My only experience with it was in case 3, in which there was no evidence of recurrence of ulcer symptoms during its administration.

SUMMARY AND CONCLUSIONS

The three cases presented seem significant because they support statements made prevously in the literature regarding the possible deleterious effect of pituitary adrenocorticotropic hormone on peptic ulcer. One of these cases demonstrates that this effect may lead to the patient's death. Two recently reported cases of acute perforation of previously undiagnosed peptic ulcer (in contradistinction to our cases) during hormone therapy are also reviewed. Emphasis was placed in those two case reports on the masking effect of pituitary adrenocorticotropic hormone on the signs and symptoms of peritonitis rather than on the relation of the hormone to the activation of the peptic ulcer. Although few cases are now available for study and the circumstantial factor is not entirely ruled out, I believe that there is enough evidence at the present time to warrant caution in the use of pituitary adrenocorticotropic hormone in patients with a history of peptic ulcer.

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Immune Globulins.—It is now well known that the immune bodies circulating in the blood and body fluids consist of modified globulins. The constitution of these globulins is at present unknown, and only intensive work like that on insulin will solve the differences between the immune body globulins and the normal serum globulins. When one thinks of the complexity of the insulin molecule, and when one bears in mind the fact that proteins are continuously being destroyed and built up again in the body, it becomes a matter of wonderment and astonishment that the injection of an antigen on two or three occasions will produce immunity in the animal body, lasting in some cases for a period of years and in others apparently for a lifetime, as in the case of yellow fever. What is the mechanism that teaches the cells to alter the constitution of the globulins synthesized by them so that immune bodies will be produced and, moreover, continue to be produced for years? Again, it is possible only to speculate on this, and we can only adopt the hypothesis supported by Burnet and Fenner (1949), and known as the self-marker theory, that the antigen remains for a very long period in the body cells capable of producing antibodies, and that the antigen acts on the cells so that they synthesize the immune globulins.—E. C. Dodds, M.D., Protein Structure and Clinical Problems, *British Medical Journal*, Dec. 2, 1950.

MEDICAL EDUCATION

A LOOK AHEAD

Donald G. Anderson, M.D., Chicago

Medical education has made such rapid and substantial advances in the past 50 years that it is a temptation to add up the score and reassure ourselves of the progress that has been made and of the undisputed quality of our present program and its product. I should like, however, to look the other way and cast a few random and speculative glances at the future of medical education.

It can safely be said that the outstanding feature of medicine and medical education during the last 50 years has been the intensity and the thoroughness with which we have sought to apply the knowledge and methods of the basic sciences to the clinical branches of medicine. The transformation of clinical medicine into a real science and the conversion, at least partially successful, of the physician from an empiricist to a scientist, who daily applies scientific methods and the technics of the laboratory to the problems presented by his patients, is the glory of modern medicine, and to this development must be credited most of the gains in medical education of the past half century.

While much remains to be done, I am sure that this concept is firmly established in our system of medical education and its pursuit will continue to be richly rewarding. What we must ask ourselves today in looking toward the future of medical education is whether the continued exploitation of this formula will remain the chief activity of our medical schools or whether other concepts will emerge and be pursued to great advantage.

There are many signs to indicate that, without a diminishing of the effort to reduce our understanding of illness to scientific terms, the great accomplishment of the medical schools in the next 25 or more years may well lie in the clearer demonstration and the broader interpretation of medicine's role in the community. Emphasizing this role, I believe, is wholly consistent with the proper functions of a medical school. Our medical schools have been supported generously by the public for the primary purpose of training physicians who can provide the people with the medical care necessary for their continuing welfare and happiness. In providing this medical care the possession of a sound knowledge of scientific medicine, although basic, is but one element. An attitude of willingness and readiness to serve where and when needed and a good understanding of how the individual physician can make his most effective contribution to what of necessity must be a cooperative effort are also fundamental considerations in discharging to the satisfaction of society the responsibility that we have incurred.

To put it another way, it has been pointed out that few if any groups have the same opportunity and thus the same responsibility as the medical schools to plot the future course of the medical profession. The medical schools for all practical purposes determine who shall and who shall not be privileged to practice medicine. To a large extent they determine what principles and technics the future members of the profession will learn, what professional attitudes they will develop and what ideals of service they will espouse. Truly great power rests in the hands of the medical schools to shape the medical profession of our times.

The demonstration and interpretation by the medical schools of medicine's role in the community is already taking many forms. One of the most significant is the renewed attention that is being focused on the patient as a whole. So much has been said concerning the importance of this concept in recent years that I shall not elaborate the point beyond stating that this concept, I believe, stems not only from physiological and psychiatric evidence of the interdependence of organs and the organism but also from a broadening sense of professional responsibility, which assumes that the physician's task does not end with the relief of the patient's immediate complaint but that the physician will continue to exert himself on behalf of the patient until the fullest possible degree of rehabilitation, in the broadest sense of the word, has been achieved.

As the medical schools have become more concerned with interpreting the role of medicine in the community, it has been but natural that they have shown more interest in the future careers of their students. They are discussing with their students the broad subject of professional responsibility, and they are helping their students to a better understanding of their future responsibilities by inviting leaders in government, in labor, in industry, in farming, in welfare work, in public health, in organized medicine and in other fields to meet with the students and present for their consideration what the people in these varied areas expect of physicians in the community effort. I think we will all agree that this is a much pleasanter and more constructive way to learn the facts of community life than through attacks in the press or from the public platform. In this same vein it may be remarked that one medical school arranges each year for a member of the state medical society's grievance committee to present to the students actual cases from the committee's files illustrating the specific types of complaints made against members of the profession.

More attention is also being given to providing the student with a better understanding of the business aspects of the practice of medicine. Perhaps it is too optimistic to hope that abuses in the matter of fees will be entirely eliminated if candid, realistic discussions of how fees should be established are substituted for the rumors of fabulous fees that too often constitute the only guides in this area that the student takes with him from his medical school years. Such discussions should help, however.

There can be no question that some knowledge and understanding of the principles of medical and hospital insurance are of importance and value to the student, who in a short time will not only care for patients

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Secretary of the Council on Medical Education and Hospitals of the American Medical Association.

Read at the Annual Meeting of the Alumni Association, University of Cincinnati College of Medicine, June 8, 1950.

insured by these plans but also have in many cases a responsible voice in establishing major policies for such plans. It has been agreed for many years now that medical schools can no longer in good conscience turn out members of a profession who are illiterate in the field of medical economics.

One of the most important tasks in the years ahead will be to give more attention than we have given to presenting to students the needs and opportunities in the different branches of medicine. Unless special efforts are made, many students will graduate with only vague ideas on this subject, since the conventional experience in medical school gives little opportunity for insight into careers in general practice, either rural or urban, in public health, in medical administration and at times into careers of teaching or practice in many of the medical specialties. Let me illustrate the problem by quoting briefly from a talk given recently by General James S. Simmons, Dean of the Harvard School of Public Health.

In speaking of the critical shortage of public health personnel in America, General Simmons said:

> Our greatest hope for solution of this problem rests, I believe, with our colleagues in the 79 medical schools of this country. They hold the key. For they, rather than we, are in a position to show their medical students how challenging and satisfying a career in public health can be.
>
> They can—and I know they will be glad to, if we counsel with them—point out the opportunities in public health. They can make sure that their students know the paths that lead from medical school to public health activity.
>
> Medical students already know about the steps they must take to surgery, to internal medicine, and to general and staff practice. They know about internships and the other requirements, the costs and the time involved.
>
> But do they know—are there adequate means for letting them know—about the public health schools, the courses and degrees, the fellowships available, the costs, the time involved and the positions open to them in the field of public health.
>
> Do they know, for instance, that there are ten postgraduate schools of public health in this country? Do they know that, after completion of their internships and residencies, they can be admitted to these schools as candidates for the postgraduate degree of Master of Public Health and that this work can be completed within one year? Do they know that those who wish to specialize or undertake research in some special phase of public health can obtain the degree of Doctor of Public Health in two or more years?
>
> Do they also know that many agencies, including foundations and the health departments of states, provide fellowships with which to finance this postgraduate education? Do they know that there are many unfilled positions for public health leaders, not only in our health agencies but in our educational institutions?
>
> Do they know (and here I fear is one of the secrets we have inadvertently been guarding all too well!) about the nature and scope of research that is being carried forward in the public health schools and by public health agencies all over the world?
>
> Do they realize that public health research, both military and civilian, has produced such new weapons against disease as: DDT, which is making it possible to eliminate malaria all over the world; effective new vaccines against such age-old scourges as epidemic typhus and new epidemiological information about the neurotropic virus diseases?
>
> Are they aware of the wide range and significance of research in the public health aspects of nutrition, epidemiology, microbiology, the adaptation of man to his environment, sanitation, the growth of children, conservation of maternal health, the social aspects of public health and the search for practical methods for community attack on mental health problems?
>
> This is research that would intrigue and captivate for life many promising young medical men, if they but knew about it. It is research that some of them will never be able to pursue, unless they enter the field of public health.
>
> I am afraid that too many medical students know too little about public health and what it can mean to them if they will dedicate their lives to it, as we have done.

General Simmons concluded by saying,

> I repeat. I believe we must look to our colleagues, the deans and professors in the medical schools, to help us solve this problem of a shocking shortage among public health personnel.
>
> I believe it our duty to call upon them to tell their students the exciting story we know so well.

I have been challenged on a number of occasions when I have put forward the proposition that medical schools have a very real responsibility for the distribution of physicians—distribution with respect both to geography and to activity. My purist friends have maintained that the sole responsibility of a medical school should be to provide its students with an understanding of scientific medicine and how to apply scientific medicine to the problems of the individual patient. I cannot accept this traditional but limited view of a medical school's function, nor do I believe that the society which supports our medical schools will accept it. Regimentation of youth and the dictation of careers by schools or government is to be abhorred. The problem of distribution, however, cannot be ignored, and I believe that we will be remiss if we do not make the maximum use of education, and by that I do not mean propaganda, to solve it.

Lest I be misunderstood, I hasten to say that I realize that the factors controlling the distribution of physicians are many and complex and that the medical schools have neither the power nor the responsibility to solve the entire problem, but I do believe that they can make an important contribution.

Not only are medical schools taking more interest in the future careers of their students, but the greatly increased activity in the field of postgraduate education by medical schools and their affiliated hospitals in recent years attests to a growing interest on the part of the schools in their own graduates and those of their sister institutions. Some teachers still regard these activities as a chore and a distraction from their primary interests of research and undergraduate and graduate teaching. More and more teachers, however, are recognizing the contribution that they can make toward elevating the standards of medical practice in a community through postgraduate courses, both centralized and decentralized, and are recognizing that participation in the continuing education of the medical profession is one of the responsibilities of a medical school.

In many regions and communities the medical schools with faculties of highly trained experts, well equipped laboratories and affiliated teaching hospitals have the outstanding medical personnel and facilities in the entire area. As a result, the schools are being looked to more and more for guidance and active

participation in community and regional health programs. Thus the schools are being called on to sponsor and participate in regional plans for hospital organization, for health surveys, for laboratory services, for coordinated research, for civilian defense, for school health, for well baby and children's programs, for screening clinics, for rehabilitation centers, for chronic disease units, for home care programs and for the development of special clinics and hospital facilities for the control and treatment of cancer, tuberculosis, psychiatric disorders, venereal diseases and other conditions of importance to the public health. It is hardly necessary to point out that many of these community activities demonstrate effectively to students, interns and residents medicine's role in the community.

In anticipation of the time that well organized and conducted city or county health departments are available, several schools are now arranging for their students to serve extended clerkships in these departments and related welfare agencies to acquire a better understanding of the contribution they make to the health program and of how they can help the physician in private practice. This is, indeed, a far advance over the day not so long ago when the professor of public health in one of our leading medical schools expressed the belief that if he could persuade his graduates to learn the telephone number of their local health officers he had accomplished about all that was essential.

By this time many are objecting strongly that the approach I have outlined will turn our medical schools into service institutions and that the primary functions of education and research will be lost in the shuffle or overwhelmed by the crushing weight of these new responsibilities. This is a very real danger. Education and fundamental research are functions that for the greater part the schools alone can perform and in the long run will contribute more to the improvement of health and medical care than any number of specific service programs in which a school may participate. To support this view we need only consider the benefits for present and future generations that would result from the discovery of a cure for cancer or for degenerative vascular disease.

What I am suggesting is not that we slacken our efforts to penetrate the unknown or to train scientific physicians but that we can and should take more interest in the role of medicine in the community than we have in the past. The schools will have to use the greatest discretion and judgment in the extent to which they can assume these new responsibilities.

Two principles are suggested, which if followed may provide the necessary safeguards. The first is that the beneficiaries of these new activities should carry the full cost and that none of the cost should be permitted to become an additional burden on the already overtaxed resources of our medical schools. This applies to all programs, whether they be designed to serve the community as a whole, an affiliated hospital or the individual patient or physician.

The second principle is that in entering on one of these programs the medical schools should seek to develop as rapidly as possible among the local personnel identified with the program persons who can at an early moment assume almost full responsibility for the administration and operation of the program, with the medical school maintaining its interest but serving primarily in an advisory or supervisory capacity. In other words, the medical schools can properly be looked to for assistance in getting such programs started and for a continuing leadership but others must supply the funds and personnel for the carrying on of these activities.

Many will probably also object that with the present crowded curriculum it will be impossible to give the attention suggested to the role of medicine in the community without either eliminating important subjects or unduly lengthening the period of undergraduate medical education. I shall not be rash enough to suggest how this new approach can be fitted in the curriculum. I will suggest that a shift of interest and attitude on the part of the faculties may be more important than a major shift in hours. As is the case when any new subject is considered for admission into the medical curriculum the school must pick and choose. The curriculum has been likened to a good-sized library, incapable of major expansion, whose shelves have been filled. As a new volume is acquisitioned, an older volume must be removed, perhaps to be put in storage, perhaps to be disposed of permanently. Should we feel unequal to the task of picking and choosing, I am sure that the seniors in the medical schools will be willing and ready to help in identifying the deadwood and the near-deadwood in the programs.

To return to the new concept that promises to prove so important for medical education in the years ahead, that of demonstrating and interpreting the role of medicine in the community, I believe it is only fair to point out that it is not just an accident or a reflection of the philosophy of the times that we are becoming interested in this problem. At least part of it is attributable to the financial problems that many medical schools have faced in recent years. In seeking additional public support, the schools have recognized the need for demonstrating more clearly than they have before the tangible, measurable benefits that flow to a community from a strong and vigorous medical school. Thus not only the philosophical but also the material growth of our medical schools in the years ahead can be related to this growing concept of interest in the community.

It is sometimes said that there have been no fundamental changes in medical education since the adoption of the graded four year curriculum more than 50 years ago. We all know that those who express such opinions do so casually and without looking below the surface. It takes little study to realize that, while medical education has, fortunately, been stabilized, it is dynamic, that changes have been continuous in response to changes in the science and practice of medicine and to changes in the needs and desires of society. There is little reason to doubt that we shall continue to see further changes in the years ahead, as the medical schools exert themselves to shape a profession that is prepared and ready to serve the expressed needs of the society that supports it.

CLINICAL NOTES

PARALYSIS WITH POTASSIUM INTOXICATION IN RENAL INSUFFICIENCY

VALUE OF ELECTROCARDIOGRAPHIC STUDIES

Robert A. McNaughton, M.D.
and
Howard B. Burchell, M.D., Rochester, Minn.

Disturbances of electrolytes in renal insufficiency have been recognized for many years, and in recent years emphasis has been laid on disturbances in the concentration of potassium in the serum and the effect of these changes on the electrocardiogram. Flaccid paralyses have been reported to be associated with both low [1] and high [2] concentrations of serum potassium. Instances of flaccid paralysis with increased concentrations of serum potassium as described by Finch and co-workers [2] were not observed by Keith and Burchell [3] in their experience with renal insufficiency, although special efforts were made to find them. The case herein reported illustrates the occurrence of flaccid paralysis in renal insufficiency with hyperkaliemia and demonstrates the use of the electrocardiogram in the immediate differentiation from hypokaliemia.

REPORT OF A CASE

A 49 year old housewife was admitted to a Rochester hospital on June 13, 1950, with a chief complaint of weakness which had progressed since its onset three months before to the extent that on admission she was virtually paralyzed.

Her family history was noncontributory. She had had two normal pregnancies and had always been in good health until 1937, when low back pain developed and she was found to have bilateral renal calculi.

The patient first came to the Mayo Clinic in 1940, with a complaint of weakness and low back pain and was found to have chronic pyelonephritis with bilateral renal calculi and an increased concentration of urea in the blood (122 mg. per 100 cc.). The renal calculi were removed first from the left side and two weeks later from the right side, and she made an uneventful recovery, with the value for urea returning to normal. However, the urinary infection, caused by Proteus ammoniae, remained resistant to treatment. The renal calculi re-formed in the period between 1940 and 1947. The concentrations of calcium and phosphate in the blood were within normal ranges during this time. The value for blood urea was reported as 58 mg. per 100 cc.; it was slightly increased above normal on several occasions. The urinary infection was resistant to therapy, and the causative organisms were cultured on repeated occasions.

Except for frequency of urination (every three hours day and night) which had been present since 1940, the patient got along well until about the middle of March 1950, three months before the present admission, when she again began to have weakness and easily induced fatigue which gradually progressed. About one month before admission anorexia and nausea developed; the patient had lost 15 or 20 pounds (6.8 or 9.1 Kg.) in two months. One week before admission, increased nausea developed and she vomited occasionally; hiccup also developed about this time. Vomiting became persistent and the fluid intake decreased until on the day before admission almost nothing was retained. During the week before admission of the patient, the weakness had progressed gradually until by the morning of admission she was unable to move. She stated that the volume of urine apparently had not decreased until a day before admission, and she had continued to pass urine in small quantities.

At the time of physical examination the patient was thin, dehydrated and unable to move. She was able to talk, gave a good history and appeared to be in no immediate distress. There were signs of dehydration, including softness of the eyeballs, decreased turgor of the skin and dryness of the mouth; however, she did not complain of thirst. The blood pressure was 86 systolic and 68 diastolic, expressed in millimeters of mercury, and the pulse rate was 108 and the respirations 20 per minute. She had "flaccid paralysis" of both upper and lower extremities, being unable to move even a finger. The patellar and ankle reflexes were absent. There were minimal reflexes in the upper extremities. The response to plantar stimulation was normal. There were no signs of weakness of the respiratory muscles. There was a loud systolic rub heard best over the left third interspace. Both kidneys were palpable, the right being the larger and measuring about 7 by 15 cm. The breath had a marked uremic odor.

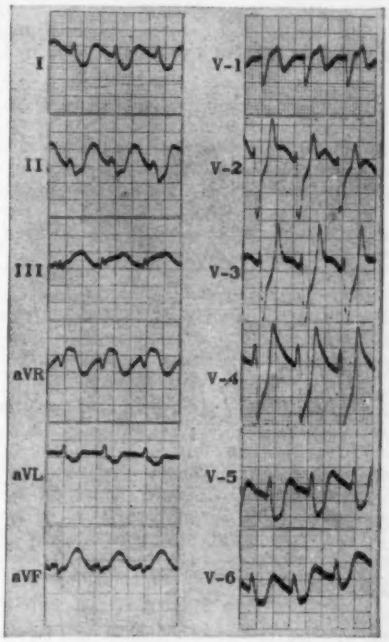

Fig. 1.—Electrocardiogram taken shortly after admission to the hosiptal, showing the intraventricular block characteristic of the late phase of potassium intoxication. No P waves can be identified.

The results of laboratory examinations were as follows: hemoglobin, 11.6 Gm. per 100 cc. of blood (or 77 per cent of normal); erythrocytes, 4,240,000 per cubic millimeter; leukocytes, 8,700 per cubic millimeter, of which 12 per cent were lymphocytes, 6 per cent monocytes and 84 per cent neutrophils; sedimentation rate, 55 mm. in one hour (Westergren method); total protein, 7 Gm. per 100 cc. of serum, with 3.3

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1. (*a*) Stephens, F. I.: Paralysis Due to Reduced Serum Potassium Concentration During Treatment of Diabetic Acidosis: Report of Case Treated with 33 Grams of Potassium Chloride Intravenously, Ann. Int. Med. **30**: 1272-1286 (June) 1949. (*b*) Holler, J. W.: Potassium Deficiency Occurring During the Treatment of Diabetic Acidosis, J. A. M. A. **131**: 1186-1189 (Aug. 10) 1946. (*c*) Brown, M. R.; Currens, J. H., and Marchand, J. F.: Muscular Paralysis and Electrocardiographic Abnormalities Resulting from Potassium Loss in Chronic Nephritis, J. A. M. A. **124**: 545-549 (Feb. 26) 1944.

2. Finch, C. A.; Sawyer, C. G., and Flynn, J. M.: Clinical Syndrome of Potassium Intoxication, Am. J. Med. **1**: 337-352 (Oct.) 1946.

3. Keith, N. M., and Burchell, H. B.: Clinical Intoxication with Potassium: Its Occurrence in Severe Renal Insufficiency, Am. J. M. Sc. **217**: 1-12 (Jan.) 1949.

Gm. of albumin and 3.7 Gm. of globulin; specific gravity of the urine, 1.007; alkaline urine; grade 3 albuminuria, grade 4 erythruria, and grade 1 pyuria (all grading on the basis of 1 to 4); blood urea, 434 mg. per 100 cc.; blood creatinine, 11.5 mg. per 100 cc.; sulfates, 24.7 mg. per 100 cc. of serum; carbon dioxide-combining power of the plasma, 7.8 volumes per cent; plasma chlorides, 86 milliequivalents per liter; serum sodium, 112 milliequivalents per liter; serum potassium, 8.6 milliequivalents per liter; serum calcium, 9.4 mg. per 100 cc. and serum phosphate, 12.2 mg. per 100 cc.

An electrocardiogram (fig. 1) made before treatment was started showed an advanced intraventricular conduction defect and a tendency toward the "wide diphasic complexes" characteristic of very high concentrations of serum potassium. No P waves could be identified. After five hours the tracing was nearly normal, showing only moderately high-peaked T waves as seen with hyperkaliemia. The following morning, 18 hours later, the electrocardiogram was normal.

The patient was given 1,000 cc. of 5 per cent dextrose in isotonic sodium chloride solution over the first four hour period. In one hour she could move her arms, and within two hours she had regained complete motion of her extremities. She was given 10 cc. of a 10 per cent solution of calcium

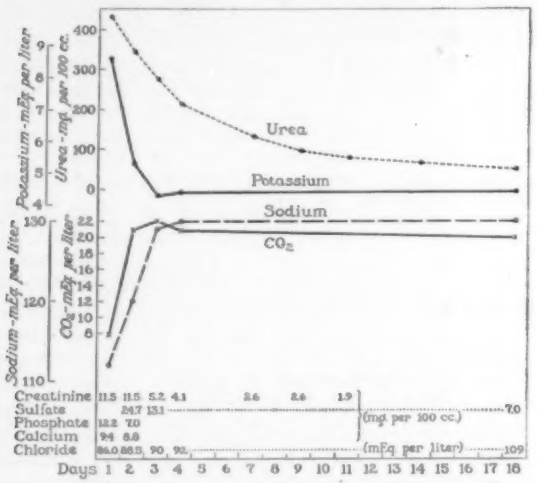
Potassium - mEq. per liter
Urea - mg. per 100 cc.
Sodium - mEq. per liter
CO2 - mEq. per liter
Urea
Potassium
Sodium
CO2
Creatinine 11.5 11.5 5.2 4.1 2.6 2.6 1.9
Sulfate 24.7 13.1 (mg. per 100 cc.) 7.0
Phosphate 12.2 7.0
Calcium 9.4 8.8
Chloride 86.0 88.5 90 92 (mEq. per liter) 109
Days 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Fig. 2.—Return of the values for blood electrolytes and blood urea toward normal.

gluconate with the last of the dextrose and saline solution. The intravenous infusion was continued by giving 500 cc. of 5 per cent solution of sodium bicarbonate (291.6 milliequivalents) and 1,000 cc. of 5 per cent solution of dextrose in water. For the next seven days she was given 1,000 cc. of 5 per cent dextrose in isotonic sodium chloride solution daily. She was able to take fluids orally in three hours and continued to drink from 2,000 to 3,000 cc. of fluid a day. She was able to eat soft foods the day after admission.

The volume of urine was 1,200 cc. the first twelve hours and remained greater than 2,400 cc. daily from then on. Chemical analysis of specimens of urine for two periods were made; the first period extended from the twenty-fourth to the forty-eighth hour and the second one from the forty-eighth to the seventy-second hour after admission. In the first period, the urinary output was 2,990 cc., the p_H was 7.2 and the specific gravity was 1.006. This volume of urine contained 166.4 milliequivalents of sodium, 53.8 milliequivalents of potassium, 20 milliequivalents of ammonia and 149.8 milliequivalents of chloride. In the second period, the output was 2,358 cc., the p_H 7.1 and the specific gravity 1.0067; the urine contained 120 milliequivalents of sodium, 44.8 milliequivalents of potassium, 17.4 milliequivalents of ammonia and 127.6 milliequivalents of chloride.

Cultures of the urine revealed P. ammoniae, which was resistant to antibiotics in obtainable titers. This urinary infection may have been the cause of the urinary ammonia found in the foregoing determinations. Roentgenograms did not disclose any abnormality of the chest but did reveal large bilateral staghorn calculi in the abdomen.

The changes in concentration of the blood urea and electrolytes are shown in figure 2. It will be noted that the concentration of urea decreased from 434 to 50 mg. per 100 cc. in 18 days and that the concentration of sulfates and creatinine paralleled this decrease. The values for potassium, sodium and carbon dioxide returned toward normal very rapidly, with little change after the third day.

The friction rub had disappeared and the reflexes had become normal by the second day. The appetite increased, and the weakness gradually disappeared. The patient gained 10½ pounds (4.7 Kg.) without edema. The value for hemoglobin decreased to 10.6 Gm., and 500 cc. of blood was given before discharge.

After urologic consultation it was decided that removal of the calculi at this time was inadvisable because of the amount of renal destruction found at the previous operations in 1940. The patient was discharged eighteen days after admission.

COMMENT

The profound muscle weakness of this patient has been referred to as paralysis; such reference seems justifiable in view of the patient's inability to move her extremities or support herself. The term "myasthenic crisis" might be suggested as an alternative. It is to be particularly noted that the muscle groups which frequently dominate the clinical picture in myasthenia gravis were not affected. The myasthenic state associated with Addison's disease in crises, with accompanying hyperkaliemia and hyponatremia, has not been observed to progress to a paralytic state to our knowledge. That the paralysis reported by Brown, Currens and Marchand [1c] was due to hypokaliemia and renal insufficiency is not convincingly established by their laboratory data, though their inferences from the electrocardiogram and the result of treatment seem sound. That paralyses may be associated with the hypokaliemia following treatment of diabetic coma [1a, b] is well established, and the marked weakness with hypokaliemia that may accompany overdosage of desoxycorticosterone acetate has been well described.[4]

When our patient was first seen, the possibility might have been entertained that a potassium deficiency was present. The importance of the electrocardiographic tracing in correcting any such false hypothesis is emphasized. The important role that the electrocardiogram may play in determining variations above or below the normal potassium state has again been pointed out by Merrill [5] in studies with the artificial kidney. In our case it seems important that the electrocardiogram was nearly normal in five hours after sodium chloride infusion, and it seems possible that the myocardial intracellular-extracellular potassium ratio might have returned toward normal by shift of potassium to an intracellular position. It is to be noted that in both cases of Finch and co-workers,[2] in which paralysis was associated with hyperkaliemia, there was rapid disappearance of the paralysis following infusion of isotonic sodium chloride solution. That

4. McGavack, T. H.: Adrenal Insufficiency: Some Pitfalls in the Treatment of Addison's Disease, J. Clin. Endocrinol. **1**: 68-75 (Jan.) 1941.

5. Merrill, J. P.; Smith, S., III; Callahan, E. J., and Thorn, G. W.: The Use of an Artificial Kidney: II. Clinical Experience, J. Clin. Investigation **29**: 425-438 (April) 1950.

there was no marked depletion of potassium but rather an excessive accumulation is supported by the fact that 53.8 milliequivalents of potassium was excreted on the second day, when no significant amount of this element had yet been ingested.

SUMMARY

In a patient with bilateral renal calculi and pyelonephritis, an acute uremic state with hyperkaliemia and hyponatremia was associated with a myasthenic crisis or paralysis. The electrocardiogram showed the typical late phase of potassium intoxication. The patient remained mentally clear. Recovery from myasthenic paralysis was rapid, as was the return of the electrocardiographic changes to normal, and the acute renal insufficiency was related to a reversible process.

PSYCHOTIC REACTIONS DURING TETRAETHYLTHIURAMDISULFIDE (ANTABUSE®) THERAPY

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L. G. McKeever, M.D.
and
Richard E. Turk, M.D., Berkeley, Calif.

In a recent series of 37 patients treated for chronic alcoholism with tetraethylthiuramdisulfide (antabuse®), we have noted six in whom transient psychotic reactions occurred. Early reports have not described this complication.

Since the first clinical application in Denmark in 1948 by Hald, Jacobsen and Larsen,[1] great interest has been shown in this drug and the possibility of its release for general use.[2] Because numerous investigators have found the treatment not without danger, we wish to note the complication of transient psychotic reaction to aid further evaluation of this new therapy.

Our use of tetraethylthiuramdisulfide in the psychiatric department of a private general hospital, following the general procedure and precautions outlined by Glud,[3] is reported elsewhere.[4] On admission, the patient is actively treated for complications and acute manifestations of alcoholism. His status is determined by psychiatric, neurological and physical examination, including urinalysis, complete blood cell count, serologic tests, glucose tolerance test, sulfobromophthalein retention test and usually an electrocardiogram. Suitable patients receive tetraethylthiuramdisulfide for four days, followed by a small amount of liquor given as a test reaction, to demonstrate the disagreeable symptoms caused by ingestion of alcohol after tetraethylthiuramdisulfide is taken. On recovery from this reaction the patient is discharged and a maintenance dose of the drug is prescribed. In four days he returns for a second test with alcohol. Psychotherapy continues through frequent office appointments. The daily dose of the drug may be adjusted to individual needs.

Severe psychotic reactions developed in six of our 37 patients soon after the beginning of treatment. Of these, five were unable to continue treatment.

REPORT OF CASES

CASE 1.—Mrs. G. K., aged 55, a chronic alcoholic for 20 years, was treated intensively for alcoholic gastritis, acute avitaminosis, polyneuritis and hepatitis. Sluggish miotic pupils indicated organic brain damage, and psychiatric examination revealed organic defects of recent memory, with some tendency toward confabulation. The results of a spinal fluid examination were normal. This Korsakoff-like reaction cleared after three weeks, and tetraethylthiuramdisulfide was given.

Psychotic Reaction.—After ingestion of 5 Gm. of tetraethylthiuramdisulfide in four days, the patient became confused, unable to follow simple instructions and disoriented for time and place. Recent memory was grossly impaired; she felt as if she were "floating around in a vacuum" and was drowsy to the point of being stuporous. The sulfobromophthalein rentention at 30 minutes had increased from 0 to 10 per cent. The use of tetraethylthiuramdisulfide was discontinued. In two days the patient was oriented, but recent memory was still impaired. In four days recovery from the acute delirious reaction was complete.

CASE 2.—E. G., aged 37, with a history of heavy drinking since the age of 20, had had various aversion treatments. Moderate avitaminosis, malnutrition and mild polyneuritis were present. The Rorschach test indicated deep-seated character neurosis and regression to helplessness, possibly with slight organic brain damage. The psychiatric diagnosis was chronic alcoholism without psychosis. After correction of nutritional deficiencies, tetraethylthiuramdisulfide was given, and the patient was seen in weekly psychotherapeutic visits. Six weeks after administration of the drug, the sulfobromophthalein retention at 30 minutes had increased to 16 per cent. Against advice the patient stopped medication and drank heavily for 10 days. He was again hospitalized. When the sulfobromophthalein retention was 5 per cent at 30 minutes, ingestion of tetraethylthiuramidisulfide was resumed at the previously satisfactory dose of 0.5 Gm. a day.

Psychotic Reaction.—Three days later the patient was readmitted on an emergency status. His brother reported him to be "confused and acting queerly" but was certain that he had ingested no liquor. The admitting nurse detected an odor of alcohol on his breath. Psychiatric examination revealed the patient drowsy, disoriented for time, place and person, with an amnesic period of several hours, impairment of recent memory and deficiency in retention and recall. These symptoms gradually disappeared during the next three days, the tetraethylthiuramdisulfide therapy having been discontinued.

CASE 3.—H. N., aged 38, was admitted with a history of chronic bronchial asthma and of heavy drinking for many years. Psychiatric examination revealed an immature person still dependent on his mother. When drinking heavily he had occasionally implied that his wife was unfaithful. The psychiatric diagnosis was chronic alcoholism without psychosis. Since the sulfobromophthalein sodium retention was 20 per cent at 30 minutes, he was treated for liver disease. A week later administration of tetraethylthiuramdisulfide was begun, although the liver function had not demonstrably improved. The first test reaction was successful; the second test was postponed because of an asthmatic attack.

From the Department of Psychiatry, University of California School of Medicine and Herrick Memorial Hospital (Dr. Bennett); from the Herrick Memorial Hospital (Dr. McKeever and Dr. Turk).

1. Hald, J.; Jacobsen, E., and Larsen, V.: The Sensitizing Effect of Tetraethylthiuramdisulfide (Antabuse) to Ethyl Alcohol, Acta pharmacol. et toxicol. **4**: 285 (Dec.) 1948.

2. Treatment of Alcoholism with Tetraethylthiuramdisulfide, editorial, J. A. M. A. **142**: 420 (Feb. 11) 1950.

3. Glud, E.: The Treatment of Alcoholic Patients in Denmark with "Antabuse": With Suggestions for its Trial in the United States, Quart. J. Stud. on Alcohol **10**: 185 (Sept.) 1949.

4. Bennett, A. E.; McKeever, L. G., and Turk, R. E.: "Antabuse" in the Treatment of Alcoholism in a Private General Hospital, California Med. **73**: 141 (Aug.) 1950; Experiences with Antabuse Treatment of Alcoholism in a General Hospital, J. Nerv. & Ment. Dis. **112**: 393 (Nov.) 1950.

Psychotic Reaction.—After two weeks of tetraethylthiuramdisulfide therapy, the patient showed mild confusion and defects of memory for recent events. Speech was incoherent at times. Paranoid reactions involved fears of the hospital, physician and F. B. I. Although doses of tetraethylthiuramdisulfide were reduced from 0.75 to 0.5 Gm. daily, the patient became more confused and disoriented. The use of the drug was discontinued. Confusion lasted about five days and the paranoid reaction for 10 days, when there was recovery without insight.

CASE 4.—A. W., a woman of 43, with a history of daily drinking for 15 years, was hospitalized after an overdose of barbiturates. Although glucose tolerance tests continued to show elevated values, treatment with tetraethylthiuramdisulfide was instituted, without unusual test reactions to alcohol. The patient was seen for psychotherapy at frequent intervals. Because of her severe lassitude, the dose of the drug was reduced to 0.25 Gm. daily. Two months later a test dose of 15 cc. of whisky, repeated in 20 minutes, was followed by a mild reaction.

Psychotic Reaction.—The next evening the patient was admitted to the hospital because symptoms of mental disturbance had suddenly developed. Speech was jerky and thickened, and recent memory was grossly impaired. She was partially disoriented. She said she had not taken any alcohol except during the test. The acute delirious reaction subsided completely within 24 hours. Administration of tetraethylthiuramdisulfide was started again at low dosage, without further difficulty.

CASE 5.—MRS. E. J., aged 45, addicted to daily drinking for about five years, was hospitalized because of recent frightening auditory hallucinations and a grand mal seizure. Polyneuritis, malnutrition, avitaminosis and hepatitis with ascites were present. A week of medical and nutritional care brought recovery from the acute hallucinosis and improvement in the polyneuritis and hepatitis. Despite a slightly elevated thymol turbidity (7 units) and a somewhat elevated curve on the glucose tolerance test, tetraethylthiuramdisulfide therapy was begun, with good response.

Psychotic Reaction.—Three weeks after the second test reaction the patient was readmitted, with clinical and laboratory signs of acute hepatitis and thymol turbidity elevated to 19 units. Her confusion, defects of recent memory, disorientation, euphoria and emotional lability did not resemble the previous acute hallucinosis. This acute toxic delirium cleared in a week and coincided with improved condition of the liver. Tetraethylthiuramdisulfide was not given again.

CASE 6.—M. S., aged 34, after a three year period of abstinence, began to drink again coincident with marital conflicts. There was a slightly elevated glucose tolerance curve. The psychiatric diagnosis was chronic alcoholism without psychosis. Tetraethylthiuramdisulfide sensitization and test reactions were well tolerated. On weekly psychotherapeutic interviews the patient complained of side reactions of extreme drowsiness and impotence. He reported seeing wavy lines before his eyes.

Psychotic Reaction.—In the first psychotic reaction, about three weeks after the administration of tetraethylthiuramdisulfide was started, the patient showed confusion, difficulty in simple calculations, impaired judgment and wide swings of mood and activity, with grandiose ideas about his business. Although other signs were negative, a spinal fluid examination showed a positive Kahn reaction, with a slight midzone rise of colloidal gold curve not typical of dementia paralytica. The use of the drug was discontinued, and the patient was treated with 10,000,000 units of penicillin and 36 hours of artificial fever (temperature 105 F.). There was complete remission of symptoms, and the spinal fluid became normal. After use of tetraethylthiuramdisulfide was resumed, the patient again began to act irresponsibly within about three weeks. He was arrested after striking a man who he said had called him "queer." This paranoid reaction was accompanied with confusion and defects of recent memory, with confabulation. Administration of the drug was again discontinued, and the symptoms subsided within 10 days.

COMMENT

Six patients with organic psychotic reactions after administration of tetraethylthiuramdisulfide are described, two of them with paranoid reactions and one with expansive trends. In four patients psychoses developed within three weeks while this drug alone was given. In the two remaining patients psychotic reactions developed after the ingestion of alcohol following the use of the drug for about two months. All had remission of symptoms when the drug therapy was discontinued. Five patients had evidence of liver damage and four of organic brain damage prior to treatment with tetraethylthiuramdisulfide. In only one case was the treatment reinstituted with success.

A psychodynamic explanation of these psychoses associated with the ingestion of tetraethylthiuramdisulfide might suggest that the personality difficulties that led to alcoholism became overt after pharmacologic prohibition of alcohol and that these difficulties then could be handled only by regression to a psychotic reaction. In this case the psychotic reactions should resemble symptomatically the psychoses dynamically related to the psychopathology of alcoholism, a resemblance not shown in our cases, with the possible exception of the paranoid component in two patients.

Since all the patients had such symptoms associated with organic brain damage as impairment of recent memory, disorientation and confusion, we believe that the reactions must be explained on an organic basis. Experimental work by Edwards,[5] who showed that tetraethylthiuramdisulfide in vitro greatly reduced the oxygen consumption of nervous tissue, suggests that the action of the drug alone may sufficiently interfere with metabolism to precipitate an organic psychotic reaction in patients who are barely compensated. It has been shown that all these patients had clinical or laboratory evidence of liver dysfunction or previous organic brain damage or both.

SUMMARY

Six cases of psychotic reactions of an organic type, which occurred soon after therapy with tetraethylthiuramdisulfide (antabuse®) was begun and which subsided after it was discontinued, have been described. A possible explanation on an organic basis has been suggested, based on the investigatory work cited, which indicates that the action of the drug interferes with oxygen utilization of nervous tissue. Patients treated with tetraethylthiuramdisulfide should be watched carefully for delirious reactions, especially if liver dysfunction or preexisting organic brain damage is suspected.

ADDENDUM

Because of these reactions we have in past months reduced by 1 to 2 Gm. the initial dose before test reactions and slightly reduced the maintenance dose of tetraethylthiuramdisulfide. In about 50 recent carefully selected patients this reduction appears to have prevented psychotic reactions.

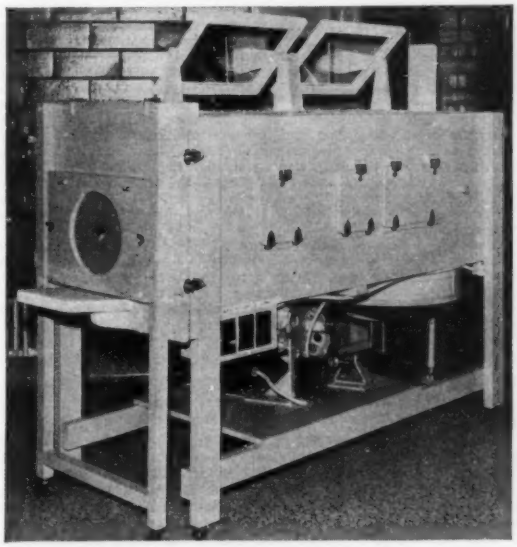
2000 Dwight Way (4).

5. Edwards, T. P.: The Effect of Tetraethylthiuram Disulfide (Antabuse) on Cellular Respiration, Texas Rep. Biol. & Med. 7: 684, 1949.

EMERGENCY WOODEN RESPIRATOR

Gerald M. Cline, M.D.
Homer O. Dolley, M.D.
and
Ralph C. Osborn, M.E., Bloomington, Ill.

An "emergency" wooden respirator can be made and assembled in a few hours from materials usually found in any community having a lumber yard, hardware store and garage or small machine shop. This respirator can be built by a carpenter or cabinet maker with some assistance from a sheet metal worker, blacksmith or garage man or a high school manual training class. The materials listed should be available in any small community. This is particularly true if the respirator is to be operated by hand. If it is desired to operate the respirator by motor, a washing machine agitator mechanism or a combination of belts and



Emergency wooden respirator.

pulleys having a total reduction ratio of 120:1 from the motor to the cam link may be employed. This ratio is important to give the proper respiratory frequency of 12 to 20 cycles a minute.

A pamphlet which graphically sets forth its construction has been prepared and is available for distribution on application to the Council on Physical Medicine and Rehabilitation of the American Medica Association. The photographs, drawings and specifica tions shown in the instructions are an accumulation of ideas on the various components offered as suggestions for making an emergency wooden respirator. Each community or group constructing a respirator of this type will have its own ideas on improvision of various components, perhaps simpler or more elaborate. This design is offered as a basis for making emergency respirators adapted to local needs and resources.

The respirator illustrated was used successfully in St. Joseph's Hospital during the poliomyelitis epidemic of 1949 as an emergency piece of equipment until an iron lung could be brought from another part of the state some 12 hours later. The Council on Physical Medicine and Rehabilitation reviewed the plans for making this simple wooden respirator and authorized the publication of a pamphlet describing the construction.

219 North Main Street.

ALLERGIC MANIFESTATIONS TO AGAR

Leo H. Criep, M.D.
and
William K. Riley, M.D., Pittsburgh

Allergy to agar manifesting itself by nasal and asthmatic symptoms has not been heretofore reported. In a brief reference in his revision of Vaughan's "Practice of Allergy," [1] Black states that he had a patient sensitive to iodine who was unable to take preparations containing agar. A report of occupational nasal and bronchial allergy to agar in a baker follows.

REPORT OF A CASE

W. L., a 35 year old white man, was seen in the Allergy Clinic of the Veterans Administration Regional Office in Pittsburgh in November 1949 complaining of nasal and chest symptoms. He had been having paroxysmal attacks of rhinorrhea and nasal obstruction periodically since 1947. These symptoms were severer while he was at work in the bakery. In the early part of 1948 there developed a sensation of tightness in his chest that was followed by typical asthmatic attacks. He noticed that paroxysms of sneezing and asthma would invariably develop while he was handling a proprietary preparation containing agar. He used this product in the shop for the preparation of meringue for pies. Antihistaminics and epinephrine gave him symptomatic relief.

Physical examination revealed a well developed, obese, 35 year old white man. The nasal mucous membranes were pale, bluish and edematous. Chest examination on several occasions revealed asthmatic rales bilaterally.

Laboratory examinations were noncontributory except for 8 per cent eosinophils in the peripheral blood. Intracutaneous tests elicited the following reactions: agar 1:1,000, moderate; agar 1:100, marked; agar 1:10, marked; bakery sweepings 1:1,000, minimal; bakery sweepings 1:100, marked; bakery sweepings 1:10, marked. Passive transfer tests showed marked positive reactions to agar and to bakery sweepings. A sniff test with agar produced nasal obstruction, rhinorrhea and lacrimation.

The history, skin tests (both direct and indirect) and the sniff tests corroborated the clinical impression that this was a case of occupational allergy to agar. Hyposensitization treatment was instituted with an extract of agar. The patient had a marked constitutional reaction after the first treatment, when he received 0.05 cc. of a 1:10 dilution of agar. With continued treatment with smaller doses and the use of a nasal filter he finds it possible to continue working.

COMMENT

In 1942, Gelfand [2] gave a report on the allergenic properties of the vegetable gums with a review of all cases reported to that date. The commonest offenders

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Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

1. Vaughan, W. T.: Practice of Allergy, revised by J. H. Black, ed. 2, St. Louis, C. V. Mosby Company, 1948.

2. Gelfand, H.: The Allergenic Properties of the Vegetable Gums: Case of Asthma Due to Tragacanth, J. Allergy 14: 203, 1943.

appeared to be acacia, karaya and tragacanth. These produced symptoms as a result of inhalation. The symptoms for the most part were those of vasomotor rhinitis, bronchial asthma, urticaria, atopic dermatitis and gastrointestinal disturbances.

Agar in the dry form is a mucilaginous substance obtained from various species of Gelidium and related algae. Chemically, it is a polysaccharide belonging to the same class of carbohydrates (heteropolysaccharides) as tragacanth and acacia. Agar has the following uses: in laboratory procedures, particularly as an ingredient in bacteriologic mediums; in pharmaceutical preparations, such as liquid petrolatum emulsions stabilized with agar; in dairy, confectionery and bakery products, such as sherbets, icing and meringue; in dental impression compounds, and as a lubricant for dies, such as those used in the drawing of tungsten filaments for lighting units.

Although the use of agar in industry is not too widespread, it may be a factor in certain cases of clinical allergy as indicated in the above case.

SUMMARY

A case of occupational allergy to agar is reported. The properties, industrial uses and possible clinical significance of agar are reviewed.

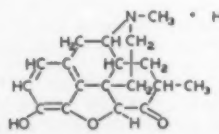
COUNCIL ON PHARMACY AND CHEMISTRY

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. STORMONT, M.D., *Secretary.*

Metopon Hydrochloride.—$C_{16}H_{21}NO_5.HCl$.—N.W. 335.83.—7-Methyldihydro-morphinone hydrochloride. — The structural formula of metopon hydrochloride may be represented as follows:



Actions and Uses.—Metopon hydrochloride is a morphine derivative, which is effective orally and may possess fewer undesirable side actions than the parent compound. Although nausea, vomiting, diarrhea and mental agitation may occur, these are usually of less intensity and shorter duration than with comparable doses of morphine. Metopon hydrochloride also produces less hypnosis than equal analgesic doses of morphine; tolerance and dependence develop less rapidly and disappear more quickly than with morphine.

Metopon hydrochloride is recommended only for the control of pain, particularly in terminal cancer. It should not be used as a preanesthetic medication because it may cause unpredictable and severe respiratory depression when used in conjunction with an inhalation anesthetic and because its hypnotic power is small.

Dosage.—Orally, 6 to 9 mg. depending on the severity of the pain. This dose should be repeated only on the recurrence of pain; regular administration is to be avoided, since this tends toward the development of tolerance. It is desirable to keep the dose at the lowest level that will provide pain relief.

Tests and Standards.—

Physical Properties: Metopon hydrochloride is a white, odorless, crystalline powder. It is very soluble in water, sparingly soluble in alcohol, slightly soluble in chloroform, very slightly soluble in ether and insoluble in benzene. A 1 per cent aqueous solution has a p_H of about 5.0 and a specific rotation, $[\alpha]$ 25, D, of -97, $\pm 5°$.

Identity Tests: Place about 1 mg. of metopon hydrochloride in a small test tube and add 2 drops of 10 per cent alcoholic *m*-dinitrobenzene, followed by 1 drop of 10 per cent sodium hydroxide: a pale peach color is produced immediately (*distinction from dihydromorphinone hydrochloride, which gives a mauve color*).

Dissolve about 0.25 Gm. of metopon hydrochloride in 25 ml. of water, and add ammonia T.S. dropwise until the solution is alkaline to phenolphthalein test paper. Allow the solution to stand overnight, filter the mixture and dry the crystalline precipitate at 105 C. for 1 hour: the metopon obtained melts between 240 and 245 C.

Purity Tests: Dry about 1 Gm. of metopon hydrochloride, accurately weighed, at 105 C. for 4 hours: the loss in weight is not more than 0.25 per cent.

Char about 1 Gm. of metopon hydrochloride, accurately weighed. Cool, add a few drops of sulfuric acid and ignite: the amount of residue is not more than 0.1 per cent.

Assay: (Metopon) Transfer about 75 mg. of metopon hydrochloride, accurately weighed, to a separatory funnel and dissolve it in 25 ml. of water. Add 10 ml. of saturated sodium bicarbonate and extract the liberated base with at least five 25 ml. portions of chloroform. Combine the extracts and wash them with about 35 ml. of cold water. Filter the chloroform layer through a paper moistened with chloroform and rinse the filter with 20 ml. of chloroform, adding the rinsings to the chloroform solution. Evaporate the chloroform solution almost to dryness on a steam bath. Add 5 ml. of water and exactly 25 ml. of 0.02 *N* sulfuric acid. Again warm the mixture on a steam bath to expel the last traces of chloroform. Cool the solution and titrate it with 0.02 *N* sodium hydroxide using methyl red T.S. as an indicator. Each ml. of 0.02 *N* sulfuric acid used is equivalent to 0.005987 Gm. of metopon. The amount of metopon present is not less than 87.5 nor more than 91.0 per cent.

(Chloride) Dissolve about 0.5 Gm. of metopon hydrochloride, accurately weighed, in 50 ml. of water in a glass-stoppered Erlenmeyer flask. Add 3 ml. of nitric acid, 50 ml. of 0.1 *N* silver nitrate and 3 ml. of nitrobenzene. Shake the mixture vigorously for 1 minute, add 2 ml. of ferric ammonium sulfate T.S. and titrate the excess silver nitrate to an amber color with 0.1 *N* ammonium thiocyanate. Each ml. of 0.1 *N* silver nitrate is equivalent to 0.03546 Gm. of chloride. The amount of chloride present is not less than 10.26 nor more than 10.86 per cent.

Dosage Forms of Metopon Hydrochloride

CAPSULES. *Identity Tests:* The contents of the capsules respond to the identity tests in the monograph for Metopon Hydrochloride.

Assay: Empty and weigh the contents of 20 capsules to determine their average weight. Accurately weigh an amount of the powder equivalent to 80 mg. of metopon hydrochloride. Place the powder in a separatory funnel, add 50 ml. of water and shake until it is dissolved completely. Proceed as directed in the assay for metopon in the monograph for Metopon Hydrochloride.

Each ml. of 0.02 *N* sulfuric acid used is equivalent to 0.006717 Gm. of metopon hydrochloride. The amount of metopon hydrochloride present is not less than 95 nor more than 105 per cent of the labeled amount.

Capsules Metopon Hydrochloride: 3 mg. Parke, Davis and Co., Detroit.

Capsules Metopon Hydrochloride: 3 mg. Sharp and Dohme, Inc., Glenolden, Penn.

Propylthiouracil-U.S.P. (See New and Nonofficial Remedies 1950, page 369).

Tablets Propylthiouracil: 50 mg. Physicians' Drug and Supply Company, Philadelphia.

***p*-Aminosalicylic Acid** (See THE JOURNAL, Oct. 28, 1950).

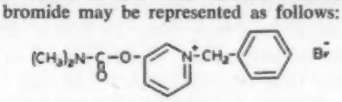
Powder Para-Aminosalicylic Acid: 454 Gm. bottles. American Pharmaceutical Company, New York.

Tablets Para-Aminosalicylic Acid: 0.5 Gm. American Pharmaceutical Company, New York.

Vitamin B_{12}—U.S.P.—(See New and Nonofficial Remedies 1950, page 492).

Solution Crystalline Rametin: 10 cc. vials: A solution containing 10 or 15 micrograms of vitamin B_{12} in each cc. Preserved with 0.5 per cent phenol. The Bio-Ramo Drug Co., Baltimore.

Benzpyrinium Bromide.—*Stigmonene Bromide* (Warner).—1-Benzyl-3-(dimethylcarbamyloxy) pyridinium bromide.—$C_{15}H_{17}BrN_2O_2$.—M.W. 337.22.—The structural formula for benzpyrinium bromide may be represented as follows:



Actions and Uses.—Benzpyrinium bromide is a cholinergic drug having the same actions and uses as neostigmine. See general statement on neostigmine.

Dosage.—For prevention of postoperative intestinal atony or postoperative abdominal distention and urinary retention, 0.5 mg. by intramuscular injection immediately following the conclusion of the operation and every three to four hours until a total of six injections has been given. For treatment of postoperative distention, 0.5 mg. by intramuscular injection followed by a small low enema 20 to 30 minutes after injection. The injection should be repeated every three hours until a total of not less than six doses has been administered. Treatment of established postoperative urinary retention, 0.5 mg. by intramuscular injection, followed by application of heat to the lower part of the abdomen. This dose should be repeated at three hour intervals until a total of five doses has been given. If urine is not spontaneously voided after the first injection, catheterization should be performed one hour after the first dose.

Tests and Standards—

Physical Properties: Benzpyrinium bromide is a white to slightly yellow crystalline powder with almost no odor. It melts between 114 and 120 C. It is very soluble in alcohol and water, and practically insoluble in ether. A 1 per cent solution of benzpyrinium bromide has a pH between 4.5 and 5.5.

Identity Tests: To about 2 ml. of a 1 per cent solution of benzpyrinium bromide, add 1 ml. of diluted nitric acid and 1 ml. of silver nitrate T.S.: a pale yellow precipitate forms, which is practically insoluble in ammonia T.S. (*presence of bromides*).

Place about 1 mg. of benzpyrinium bromide in a small porcelain dish, and add 2 ml. of water and 0.5 ml. of 40 per cent sodium hydroxide. Evaporate the solution to dryness on a steam bath. Transfer the residue to a small test tube and heat it in an oil bath at 250 C. for 30 seconds. Cool the tube and dissolve the residue in 0.5 ml. of water. Cool the solution in an ice-bath and add 1 ml. of diazobenzene-sulfonic acid T.S.: a cherry-red color is produced.

Dissolve about 0.1 Gm. of benzpyrinium bromide in 50 ml. of water and add 25 ml. of a saturated solution of picric acid (about 0.5 Gm.) containing 0.2 ml. of sulfuric acid. Permit the reaction mixture to stand at room temperature for 2 hours and then remove the yellow crystalline precipitate by filtration. Wash the precipitate with about 15 ml. of cold water and dry it: the picrate melts between 114 and 120 C.

Purity Tests: Dry about 1 Gm. of benzpyrinium bromide, accurately weighed, at 80 C. for 4 hours: the loss in weight is not more than 1 per cent.

Char about 0.5 Gm. of benzpyrinium bromide, accurately weighed, over a low flame. Cool the crucible, then add 1 ml. of sulfuric acid and continue ignition until no carbon remains. The residue is not more than 0.1 per cent.

Assay: (Benzpyrinium Bromide) Transfer about 0.3 Gm. of benzpyrinium bromide, accurately weighed, to a 1,000 ml. volumetric flask and dilute to the mark with water. Mix thoroughly, transfer 10 ml. of the solution to a 100 ml. volumetric flask and dilute to volume with water. The final solution (0.003 per cent) exhibits an ultraviolet absorption minimum at about 2,420 A and a maximum at about 2,690 A, $E\ (1\%,\ 1\ cm.) = 136 \pm 3$.

(Dimethylamine) Place about 0.1 Gm. of benzpyrinium bromide in a semi-micro Kjeldahl flask, and add 50 ml. of water and 15 ml. of 10 per cent sodium hydroxide. Connect the flask with a distillation trap to a water-cooled condenser, which dips into 15 ml. of 4 per cent boric acid solution. Distil until about 50 ml. of distillate has been collected. Using a mixed indicator (1 part methyl red T.S. and 5 parts bromocresol green T.S.) titrate the liberated dimethylamine with 0.05 *N* sulfuric acid. Each ml. of 0.05 *N* acid is equivalent to 0.01686 Gm. of benzpyrinium bromide. The amount of benzpyrinium bromide present is not less thon 98.5 nor more than 101.5 per cent.

Dosage Forms of Benzpyrinium Bromide Solution–Identity Tests: Place an amount of solution equivalent to 1 mg. of benzpyrinium bromide in a small procelain dish and add 0.5 ml. of 40 per cent sodium hydroxide. Proceed as directed in the color identity tests in the monograph for Benzpyrinium Bromide beginning with, "Evaporate the solution to dryness . . ."

Assay: Transfer to a 100 ml. volumetric flask a volume of solution equivalent to 2.5 mg. of benzpyrinium bromide. Dilute to the mark and shake the mixture thoroughly. Determine the optical density of the solution at 2,690 A with a spectrophotometer. The number of mg. of benzpyrinium bromide per ml. of the prepared solution = optical density at 2,690 A ÷ 13.6. The amount of benzpyrinium bromide is not less than 90 nor more than 110 per cent of the labeled amount.

Solution Stigmonene Bromide 1:2,000: 1 cc. ampuls; a solution containing 0.5 mg. of benzpyrinium bromide in each cc. William R. Warner & Co., Inc., New York, New York.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

The Council on Physical Medicine and Rehabilitation has authorized publication of the following report.

HOWARD A. CARTER, *Secretary.*

HYDROCOLLATOR STEAM PACKS ACCEPTED

Manufacturer: Chattanooga Pharmacal Company, Inc., 1402 Manufacturers Road, Chattanooga 3, Tenn.

The Chattanooga Pharmacal Company, Inc., applies the name "Hydrocollator" (1) to a colloid-filled cloth bag which can be soaked and heated in hot water for application to the patient as a hot pack and (2) to a thermostatically controlled heater in which packs of this sort can be brought to a predetermined temperature when they are to be used. The heater does not come within the purview of the Council, but the hot pack does. The latter is the subject of this report.

Each pack is made of a material described by the manufacturer as "96 by 64, 2.85 Jeans Cotton Cloth." It is sewed into a sack measuring 25 by 30 cm. (10 by 12 inches), which is divided quiltlike into rectangles measuring 5 by 12 cm. (2 by 4¾ inches). Each of these rectangular sections contains 28 Gm. (1 ounce) of a hydrous aluminum silicate called bentonite, which meets the U. S. P. XII requirements. The division into sections makes it easy for one to fold or roll the pack in applying it to extremities.

Hydrocollator Steam Packs

The bentonite is a well known mineral related to the clays, widely used in the industries, and a useful ingredient in dentifrices. While the hydration of bentonite can be aided by alkalies, including the very mild oxide of magnesium, the physical state is also important. According to the manufacturer, the processing of bentonite for use in the Hydrocollator Steam Packs involves no addition of chemicals but consists simply of a comminution followed by sifting. A certain particle size, neither too large nor too small, is optimum for the desired subsequent hydration.

The bentonite used in the packs submitted by the manufacturer had the appearance of finely ground flaxseed. When wet, it was dark gray and had a mild but inoffensive odor. The dry pack weighed about 100 Gm. (4 ounces); when completely soaked it weighed about 450 Gm. (1 pound). The process of saturation at 160 F. took 30 to 40 minutes. (This temperature at which the test was done is much higher than that recommended for actual use. The working temperature is extremely important to the patient and will be determined by the operator.) The Council on Physical Medicine and Rehabilitation voted to include the Hydrocollator Steam Packs in its list of accepted devices.

CORRECTION

Glolite Luminous Infrared Ray Lamps, Models 439, 751, 1151 and 1451, Accepted.—Manufacturer, Paul E. Johnson Manufacturers, Inc., 2508 South Parkway, Chicago 16.

The description of these lamps in THE JOURNAL Nov. 25, 1950, page 1093, with respect to the source of radiation for all lamps, should have read: "The source of radiation for all lamps is a rod, made of nonmetals, like carbon and silicon, heated by the passage of the current."

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THE COXSACKIE VIRUSES

Investigation of several small epidemics of poliomyelitis in upstate New York led to the isolation by Dalldorf and Sickles,[1] from the acute phase fecal specimens of two children, of an agent that induces paralysis in suckling mice and hamsters. This paralysis is associated with destructive lesions of skeletal muscles, the central nervous system being unaffected. The virus was named Coxsackie, the name of the village where these two patients resided. The same virus was later isolated from specimens of feces from children exhibiting symptoms of poliomyelitis. These viruses produced degeneration of skeletal muscles of suckling mice and hamsters. Patients whose feces virus was isolated exhibited muscle weakness or paralysis that sometimes persisted for months.

Howitt [2] reported 108 isolations of the Coxsackie group of viruses from the secretions or tissues of 97 patients from nine different states. The following states were mentioned: Alabama, Colorado, Delaware, Florida, Georgia, Louisiana, Oklahoma, South Dakota and Tennessee. The inoculation of 3 to 5 day old mice with positive human material produced symptoms of pronounced ataxia followed by muscle paralysis, after which death occurred almost immediately or in several days. Virus was present in the brains and the skeletal muscles of the infected mice. The histopathological lesions were confined to the muscles.

The Coxsackie virus was isolated from human feces, urine, nasopharyngeal or mouth washings, mouth vesicles, nasal swabs, saliva, sputum, serum, whole blood, cord and brain. The virus has been isolated from sporadic cases and from groups of patients involved in diseases with variable and ill-defined clinical pictures, such as mild fevers, poliomyelitis-like or influenza syndromes and occasionally encephalitis.

1. Dalldorf, G., and Sickles, G. M.: An Unidentified, Filtrable Agent Isolated from the Feces of Children with Paralysis, Science **108**: 61 (July 16) 1948.
2. Howitt, B. F.: Recovery of the Coxsackie Group of Viruses from Human Sources, Proc. Soc. Exper. Biol. & Med. **73**: 443 (March) 1950.
3. Howitt, B. F., and Benefield, U. R.: Use of Complement Fixation in the Differentiation of Strains of Coxsackie Virus, Proc. Soc. Exper. Biol. & Med. **73**: 90 (Jan.) 1950.
4. Melnick, J. L.; Shaw, E. W., and Curnen, E. C.: A Virus Isolated from Patients Diagnosed as Non-Paralytic Poliomyelitis or Aseptic Meningitis, Proc. Soc. Exper. Biol. & Med. **71**: 344 (July) 1949.
5. Shaw, E. W.; Melnick, J. L., and Curnen, E. C.: Infection of Laboratory Workers with Coxsackie Viruses, Ann. Int. Med. **33**: 32 (July) 1950.
6. Findlay, G. M., and Howard, E. M.: Coxsackie Viruses and Bornholm Disease, Brit. M. J. **1**: 1233 (May 27) 1950.

While other workers have recovered the Coxsackie viruses from cases without sequelae, in Howitt's study they were found also in the tissues and secretions of 10 patients whose disease was fatal; in five of them the diagnosis was poliomyelitis. Poliomyelitis virus was recovered also from the spinal cord of one of these patients and from the feces of two patients who had recovered. The isolation of the virus from the mouth washings of a group of six out of 12 nurses who were asymptomatic but in contact with patients having illnesses probably due to this virus favors the respiratory route of spread. The discovery of this "new virus group" with its widespread incidence may require a revision of our epidemiological thought, especially in regard to nonparalytic poliomyelitis and other minor illnesses.

Howitt and Benefield [3] were able to differentiate the Coxsackie virus into serologically distinct types by the complement fixation test with filtered muscle antigen. The same test can be employed for determination of the presence of antibodies in human serums.

Melnick, Shaw and Curnen [4] reported the isolation of a filtrable virus from the feces of patients whose disease had been diagnosed either as nonparalytic poliomyelitis or aseptic meningitis and from two patients with "fever of unknown origin." The agent was similar to that reported by Dalldorf and Sickles [1] in paralysis with myositis produced in newborn mice. The recovery of virus was correlated with the appearance of neutralizing antibodies in the patient's serum. At least two immunologic types of the virus exist. The virus was also isolated from the sewage of a number of cities and from flies collected in widely separated areas. Six workers [5] in the same laboratory developed acute febrile illnesses while studying strains of Coxsackie virus that had been isolated from the feces of patients with illnesses resembling nonparalytic poliomyelitis. A similar virus was recovered during the acute stage of illness from the pharynx of two workers and from the feces of three. The capacity to neutralize the virus was not present in serum prior to illness but was demonstrable in high titer of serum in each of the three workers after recovery.

Findlay [6] cites evidence to suggest that Coxsackie viruses 1 and 2 are widely distributed in Great Britain and that some epidemics of Bornholm disease (epidemic pleurodynia) in that country are associated with infection by Coxsackie virus 1 or 2 or closely allied viruses.

The Coxsackie viruses are apparently widely disseminated and appear to be rather common agents of infection of man. Their importance as a cause of disease is still uncertain. It is, however, apparent that there exists a common infectious disease caused by the Coxsackie virus group that occurs in close association with poliomyelitis and has some characteristics in common with that disease. These viruses differ immunologically from poliomyelitis viruses and do not cause the lesions of poliomyelitis when injected into monkeys. The role of the newly discovered viruses in the causation of human disease will be the task of further investigations.

AGED FLOUR

Devices employed in industry to enhance the attractiveness of foods, and hence their acceptability, are of considerable interest from the public health point of view. Some of the processes, though with a long history of use, are now regarded as detrimental, for one reason or another. Nitrogen trichloride, long employed as a bleaching and conditioning agent for flour, is in this category. The more recent critical experimental studies were stimulated by a report [1] in which was demonstrated the close association of epileptiform seizures or canine hysteria with the presence of flour that had been treated with nitrogen trichloride (agene) in the ration of dogs. Later it was demonstrated [2] that the toxic factor produced by agene resided in the protein fraction of the flour. A mixture of amino acids similar to that obtained by hydrolysis of gliadin, one of the wheat proteins, given intravenously to dogs produced [3] no electroencephalographic evidence of convulsions; if, however, the amino acids were first treated with agene, convulsions ensued.

Wheat proteins, zein, hemoglobin, casein, lactalbumin, egg albumin, glutenin and rice proteins are rendered toxic by exposure to agene, whereas arachin from peanuts and keratin become innocuous with this treatment. After comparing the amino acid makeup of these proteins, studying various amino acids under these conditions and removing certain suspected chemical groups from the proteins before exposing to agene, Bentley and his collaborators [4] have concluded that the amino acid methionine is in some way responsible for the toxicity of flours that have been treated with nitrogen trichloride. The difference in species susceptibility to the toxic effect of agene-treated flour is striking: the dog, ferret, cat and monkey show the typical neuromuscular symptoms, whereas the mouse, rat, chick and guinea pigs are immune. Human subjects consuming bread made from agenized flour have shown no abnormal clinical symptoms.[5] One suggestive observation [6] has been the urinary excretion of porphyrin in rats consuming agenized flour. Needless to say, approval of the use of agene in the baking industry has been withdrawn.

An appraisal of the effect on dogs of various compounds used to condition flour has shown that nitrogen trichloride is toxic but ammonium persulfate, chlorine, potassium bromate, benzoyl peroxide, nitrocyl chloride, and chlorine dioxide do not adversely affect the flour.[7] Of these, ammonium persulfate is one of the oldest artificial aging materials used for wheat flour. Recent observations on the toxicity of flour treated with this compound [8] have shown that, in dogs given a mixed diet for 16 months containing as much as 200 times the quantity used in commercial baking practice, there were no gross or microscopic abnormalities in tissues or in blood and the renal function was normal. In similar studies with rats,[9] growth and reproduction as well as hematological and histological pictures were normal. The use of ammonium persulfate as an artificial aging material is proposed in studies [10] on flours from various American wheats; this compound improves loaf volume and crumb texture and compares favorably with agene with respect to storage and baking properties of the flour. Furthermore, the vitamins in enriched flour or bread from that flour are not altered by the use of ammonium persulfate. If this material becomes recognized and used as an agent for aging flour it will provide another example of how technological progress and public health can be facilitated simultaneously when adequate research is undertaken.

PHYSICIAN PARTICIPATION IN SCHOOL HEALTH SERVICES

A survey conducted by the Bureau of Health Education of the American Medical Association indicates a level of interest, understanding and participation in school health programs on the part of medical societies that is most gratifying. A report, "Physician Participation in School Health Services," will soon be sent to the state medical associations and to more than 1,000 local medical societies that returned the questionnaire on which it was based.

One third of the medical societies replying have a school health committee. One quarter of the communities have school health councils, nine tenths of which include medical society representation. School physicians, chiefly part time, are reported by slightly more than half of the medical societies. There is little difference in the proportion of school children examined by family physicians and school physicians, and established methods of referring children to a physician through their families are reported for 80 per cent of the communities.

Channels by which the family physician can inform the school of a child's special health needs were cited for 64 per cent. Two thirds have modified physical education to meet special needs of pupils, and a quarter provide corrective exercise on medical prescription. Basic health services for athletes are reported by four out of five. First aid facilities are present in over three fourths, but only a third have complete plans for emergency care. Exclusion and readmission for communicable disease are acceptable to school and health officials in 87 per cent. Only half report preemploy-

1. Mellanby, E.: Brit. M. J. **2**: 885, 1946.
2. Mellanby, E.: Brit. M. J. **2**: 288, 1947.
3. Silver, M. L.; Monahan, E. P., and Klein, J. R.: Proc. Soc. Exper. Biol. & Med. **66**: 410, 1947.
4. Bentley, H. R.; Booth, R. G.; Greer, E. N.; Heathcoate, J. G., Hutchinson, J. B., and Moran, T.: Nature **161**: 126, 1948.
5. Silver, M. L.; Johnson, R. E.; Kark, R. M.; Klein, J. R.; Monahan, E. P., and Zevin, S. S.: J. A. M. A. **135**: 757 (Nov. 22) 1947.
6. Newell, G. W.; Erickson, T. C.; Gilson, W. E.; Gershoff, S. N., and Elvehjem, C. A.: J. A. M. A. **135**: 760 (Nov. 22) 1947.
7. Arnold, A.: Cereal Chem. **26**: 46, 1949.
8. Arnold, A., and Gable, F. C.: Cereal Chem. **27**: 375, 1950.
9. Arnold, A., and Gable, F. C.: J. Nutrition **41**: 459, 1950.
10. Doty, J. M., and Sherwood, R. C.: Cereal Chem. **27**: 409, 1950.

ment and periodic health appraisal of school personnel. In general the report shows that individual physicians and medical societies are active in many aspects of school health services. In some areas there is need of further support from the profession.

The Office of Education, in cooperation with the Public Health Service, Federal Security Agency, is now making a companion survey of health services in city school systems of the nation. Through a prior questionnaire from the Office of Education, the city school systems that have school health services were located. Also determined was whether the school services are administered by the schools or by the local health departments.

A further study is now being conducted by means of a questionnaire addressed to school superintendents by the Office of Education where the schools administer the program. In the other instances the questionnaire is being addressed to the local health departments by the Public Health Service. The sample coverage of the study includes 100 per cent of the roughly 1,000 larger cities (population 10,000 or more) and 50 per cent of the 1,900 smaller cities (population 2,500 to 10,000) reporting that they have a school health service. Since the survey conducted by the American Medical Association, addressed to the county medical societies, has covered the relationship of such societies to the local school health program, the two surveys will provide a rather complete picture of the school health services available to children.

FOREIGN SOCIAL SECURITY EXPENDITURES

The Research Council for Economic Security has recently published the results of a survey of expenditures under the social security laws of 11 foreign countries—Australia, Belgium, Canada, Chile, Denmark, France, Great Britain, Mexico, Norway, Sweden and Switzerland.[1] This study deserves special attention because it presents clearly the relation between expenditures for social security programs and the national income of each of the countries. Breakdowns of the expenditures under social security laws enable the reader to find what percentage of the national income of each country is spent for medical services, for old age benefits, for unemployment compensation and for other social services. Comparisons of social security expenditures with total government expenditures in each country are also given. An average of 15.5 per cent of the government budgets and 3.4 per cent of the national incomes in these countries is being spent for social security programs. Wars and depressions have influenced the cost and development of these programs. Some of the countries devote the largest proportion of their social security expenditure to a single program; for example, in Great Britain, health and medical care; in France and Canada, family allowances, and in Belgium, unemployment compensation. These studies provide interesting information, although it is difficult to forecast accurately future plans. Unfortunately the survey covers only social security expenditures, not consumer expenditures, for medical care.

1. Social Security Abroad: Financial Cost and Program Emphasis, Publication 77, Chicago, Research Council for Economic Security, 1950.

RECOMMENDATIONS ON DEFINITIONS OF LIVE BIRTH AND FETAL DEATH

Under the direction of the Expert Committee on Health Statistics a significant set of recommendations was made to the Third World Health Assembly and adopted by that assembly in May 1950, a portion of which is contained in the United States Public Health Service publication [1] "International Recommendations on Definitions of Live Birth and Fetal Death." Great variation has existed in the definitions of stillbirth and live birth in the different nations of the world. Through the efforts of the Expert Committee on Health Statistics and the World Health Assembly, as well as other international organizations, a sincere attempt is being made to standardize these definitions so that more nearly comparable vital statistics can be obtained from the several countries cooperating in the effort.

The committee recommends a uniform definition of live birth and live born which essentially classifies as live born any product of conception that shows evidence of breathing, heartbeat or definite movement of a voluntary muscle. Fetal death is defined as the reverse of a live birth; namely, a product of conception that after separation from the mother fails to qualify as live born. It is recommended that the term "stillbirth" be dropped, if possible, and that fetal deaths be classified on the basis of gestation into the following groups:

Group I: Early fetal deaths—less than 20 completed weeks of gestation.

Group II: Intermediate fetal deaths—20 completed weeks of gestation but less than 28.

Group III: Late fetal deaths—28 completed weeks of gestation and over.

It is further suggested that live births be tabulated on the basis of a similar grouping of the gestation period with, of course, a classification for gestation period unknown. The publication also gives recommendations concerning the registration of fetal deaths and the statistics that should be obtained on the fetal death certificate. It should be assumed that every live birth should be registered and that a death certificate be made out for an infant death even though the death occurs immediately after birth.

It is difficult to overstress the importance of the standardization of definitions and reporting procedures in all phases of vital statistics. It is encouraging to see international cooperation on this point, and the medical profession should assist in every way possible in the preparation of accurate and complete birth and fetal death certificates.

1. International Recommendations on Definitions of Live Birth and Fetal Death, Publication 39, Federal Security Agency, United States Public Health Service, National Office of Vital Statistics, 1950.

ORGANIZATION SECTION

FEDERAL LEGISLATION

Aid to Medical Education

Representative Burnside of West Virginia introduced H. R. 2152, a bill to promote the national defense and security by providing for a temporary program to aid in relieving the shortage of physicians and other health personnel. The bill provides for two programs. 1. It would authorize $150,000,000 during the next five years as direct grants for defraying all or part of the cost of construction and equipment of new medical schools. Single grants are limited to $15,000,000. All grants made would be conditioned on the schools' providing admission to out of state students. Each school so established must have at least 550 teaching hospital beds within a radius of 30 miles. 2. The bill would also improve and expand existing "health profession schools" (which are defined as schools of medicine, dentistry, public health, nursing or other schools for the education and training of health personnel, including teaching hospitals and other facilities related to such schools) by authorizing $30,000,000 each year for the next five years. No grant for these "health profession schools" would be authorized in excess of 30 per cent of the cost of construction and equipment. These schools would also have to provide reasonable opportunity for the admission of out of state students.

If part of the funds provided for either medical schools or health profession schools is to be used for the construction of hospital facilities, application first must be made under the Hill-Burton Act and refused for one or more of the following reasons: (*a*) the project has insufficient or no priority, (*b*) the project is not included in the state hospital construction program or (*c*) funds are not available from the state's regular hospital construction allotment. Grants made for hospital construction are subject to the same matching formula as under the Hill-Burton Act but would be made from appropriations authorized by this bill instead of the Hospital Construction Act (Hill-Burton).

The programs proposed in this bill would be administered by the Surgeon General of the Public Health Service under regulations prescribed by him with the approval of a "National Council on Professional Health Education." This council would consist of the Surgeon General and the U. S. Commissioner of Education as ex officio members and 11 others not in the full time employment of the federal government to be appointed by the President. The following organizations would be represented on the council: The Association of American Medical Colleges, American Association of Dental Schools and the National League of Nursing Education. Provisions are designed to restrict federal government supervision and control with respect to personnel, curriculum, instruction and methods and materials of instruction, and with respect to the administration of any educational institution.

Child Life Research

A bill to provide federal funds of $7,500,000 annually to enable the Federal Security Administrator to conduct and foster research in child life was introduced by Senator Douglas of Illinois, as S. 676. Grants-in-aid to schools and other public or nonprofit agencies and the establishment of research fellowships are provided in the bill. A National Advisory Council on Research in Child Life would be established to advise and consult with the Administrator on policies and to review and make recommendations on grants, training projects and research scholarships. Representative Bolling of Missouri introduced H. R. 1879, which would provide for research relating to child life and development and is somewhat similar to S. 676.

Male Nurses in Military Services

A bill, S. 661, introduced by Senator Ives of New York, would provide for the appointment of male citizens as nurses in the Army, Navy and Air Force. This bill has an identical companion in the House, H. R. 911.

The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

STATE LEGISLATION

Arizona

Bills Introduced.—H. 83, proposes the creation of an anatomy board of Arizona for the purpose of **distributing** certain **dead human bodies** to qualified institutions and persons for the promotion and furtherance of the science and art of medicine and dentistry. H. 84, proposes to authorize any hospital, institution of higher learning, laboratory, physician, surgeon, dentist or veterinarian desiring to conduct tests, perform experiments, or operate on or **dissect living animals** for the increase of knowledge relating to the cause, prevention, control and cure of disease to apply to the superintendent of public health for a vivisection permit.

Arkansas

Bills Introduced.—H. 169, proposes the creation of a state medical education board to pass upon and allow or disallow all applications for loans or **scholarships** made by students who are bona fide citizens and residents of the state who desire to become physicians and who have the necessary entrance requirements for enrolment in a four-year accredited medical college. H. 195, proposes that the sale of **barbituric acid,** amphetamine and its derivatives shall be unlawful unless upon the written and signed prescription of a person holding a license issued by one of the medical boards, by a person licensed to practice dentistry, veterinary medicine, or by a legally qualified dispensing physician, with certain exceptions relating to the wholesale sale of such drugs. The proposal would further make it unlawful for a person to prescribe or dispense any of these drugs except in the course of his professional practice and upon a personal contact with the person for whom the drugs are prescribed. H. 206, proposes the establishment of the office of **state medical examiner** and proposes that the director of such office shall be the head of the department of pathology of the University of Arkansas medical school. Such office would establish a laboratory having adequate facilities for the conduct of autopsies and of such pathological, bacteriological, toxicological examinations as may be necessary or proper. H. 219, proposes the appointment of a state **commission on alcoholism** to, among other things, maintain information centers in the larger cities in the state and to give free advice and to dispense information on alcoholism.

California

Bills Introduced.—A. 987, to amend the health and safety code, proposes to direct the state department of public health to promulgate **minimum standards** of safety, sanitation and the physical plant, and of diagnostic, therapeutic and laboratory facilities **for** public, **medical institutions** and to certify the institutions which meet the standards as to all or part of their facilities. A. 1204, proposes to authorize the director of mental hygiene to establish and maintain hospitals for the study, treatment and rehabilitation of acute and **chronic alcoholics.** A. 1214, to amend the Business and Professions Code relating to **reciprocity** applicants, proposes that the applicant must have had a license in some other state issued at least one year prior to the date of application. S. 317, proposes to authorize the board of medical examiners to grant licenses to practice **physical therapy,** which is defined to mean the treatment of any bodily or mental condition of any person by the use of the physical, chemical and other properties of heat, light, water or electricity and by massage and active or passive exercise. The use of roentgen rays and radium for diagnostic and therapeutic purposes and the use of electricity for surgical purposes, including cauterization, are not authorized by this proposal.

Connecticut

Bills Introduced.—H. 326, proposes to authorize the **incorporation of medical clinics.** The proposal would provide that any three or more persons licensed pursuant to the medical practice act may associate to form a corporation without capital stock to own, operate and maintain a clinic for the study, diagnosis and treatment of human ailments and injuries by persons duly licensed and to promote medical, surgical and scientific research and learning provided that such corporation may not itself give medical or surgical treatment, consultation or advise and provided that persons duly licensed, and no others, may be members of such corporation. H. 521, proposes that any hospital or institution which appoints an **intern, house officer, or a resident physician** shall within ten days of the appointment notify the state department of health of the name of such intern, house officer, or resident physician, the name of the medical school of which he is a graduate, and the year of graduation, and shall give such other information as may be required on forms to be supplied by the department. H. 533, proposes that any firm or corporation employing persons to work in a manufacturing establishment shall maintain at least one **first-aid room** with a qualified trained nurse in attendance at all times the plant is in operation. S. 153, proposes to authorize the board of workmen's compensation commissioners to prepare and establish a **schedule of minimum** charges and **fees** for medical and surgical services. S. 224, proposes to authorize the issuance of state bonds, the proceeds of which should be used to construct and equip **educational facilities for** the training of medical **doctors** as part of the educational program of the University of Connecticut. S. 243, proposes to authorize the University of Connecticut to establish a course of instruction in **physical therapy** as part of the University program and to grant suitable degrees in such subject. S. 300, proposes to eliminate the requirement that **interns, residents, or house officers** must be citizens of Connecticut or must intend to become permanent citizens thereof. S. 346, to amend the law relating to the uniform state narcotic act, proposes that the term physician shall include **osteopathic physicians.**

Georgia

Bills Introduced.—H. R. 54, proposes the enactment of a constitutional amendment creating a state medical education board to receive and pass upon, allow or disallow applications for loans or **scholarships** made by students who are bona fide citizens and residents of the state of Georgia and who desire to become doctors of medicine and who are acceptable for enrolment in a qualified four-year medical school. S. 147, proposes to authorize **osteopaths** to execute the required prenatal examination certificates.

Idaho

Bill Introduced.—H. 30, proposes certain amendments to the osteopathic practice act one of which is the provision that every applicant to practice **osteopathy** shall have the **right to practice** in each of the fields of manipulative maintenance and respiration of structural integrity of the body mechanism, obstetrics, minor surgery, and for such purposes may use, within the limits of accepted standards of osteopathic practice, corrective and diagnostic machines, appliances and devices, and prescribe as incidental to the field of practice herein defined, and use as may be necessary, antiseptics, medicaments, drugs and chemical compounds; and may take pre-marital and pre-natal blood tests and food-handlers' blood tests and certify the same.

Indiana

Bills Introduced.—H. 165, to amend the workmen's compensation act, proposes, among other things, that the employer shall furnish free of charge to the injured employee an **attending physician** of the injured **employees choice,** should the injured employee express his choice of such attending physician. S. 100, proposes that all physicians shall **report** within ten days to the state board of health in writing the name and address of every person diagnosed by him as a case of **epilepsy** or other similar disorders characterized by lapses of consciousness.

Iowa

Bills Introduced.—H. 284, to amend the workmen's compensation act, proposes to authorize the employee to have the right to make the **choice of the** attending **physician** from a panel of physicians to be named by the employer. S. 183, proposes the creation of a board on **postmortem examinations,** the executive officer of which shall be the chief medical referee, who shall be a skilled pathologist and eligible to be licensed in Iowa to engage in the practice of medicine and surgery. The law relating to coroners would be repealed with the enactment of the above proposal.

Minnesota

Bills Introduced.—H. 201, proposes the creation of a **disability benefit** fund. H. 240, proposes to require the coroner upon taking possession of the body of any person whose identity is not established, to make a **finger print** of each finger of such deceased person and to furnish copies thereof to the superintendent of the bureau of criminal apprehension. S. 229, to amend the osteopathic practice act, proposes to authorize **osteopathic physicians** and surgeons to exercise the same **rights and privileges** of practice possessed by physicians and surgeons of other complete schools of medicine and surgery.

Missouri

Bills Introduced.—H. 143, proposes to authorize the curators of the University of Missouri to establish a full and complete **course of medical and surgical instruction** at the University. H. 136, proposes to authorize the state board of medical examiners to **revoke licenses** of any person who accepts, in addition to his fee for professional services, any **rebate,** commission or any other type of payment either directly or indirectly in connection with the writing or filling of a prescription.

Montana

Bills Introduced.—H. 143, to amend the law relating to **chiropractors,** proposes among other things a new definition for chiropractic stating that chiropractic is a science that is a separate and distinct branch of the healing art, having its own colleges, college accrediting agency, its own scientific organization and practice act. The basic purpose of chiropractice is the restoration and maintenance of the structural and functional integrity of the human body. The practice of chiropractic consists of all necessary means to carry out this basic principle. S. 75, proposes to require **physicians to report to** the state board of health cases of epilepsy, cerebral spinal syphilis, advanced heart disease, hypertension, and arterial degeneration involving the brain, in addition to other diseases now contained in the present law.

New Hampshire

Bill Introduced.—S. 13, proposes to authorize the board of registration and medicine to issue licenses to practice **physical therapy,** which is defined to mean the treatment of any bodily or mental condition of any person by the use of the physical chemical and other properties of heat, light, water, electricity, massage and therapeutic exercise which include physical rehabilitation procedures. The use of roentgen rays and radium for diagnostic and therapeutic purposes and the use of electricity for surgical purposes, including cauterization, are not authorized by the proposal.

New Jersey

Bill Introduced.—S. 25, to amend the temporary disability benefits law, proposes to authorize treatment by **chiropodists** of persons claiming benefits thereunder.

New Mexico

Bill Introduced.—H. 28, to amend the medical practice act, proposes that nothing shall be construed to prohibit any **physician** who has been lawfully licensed to practice in another state from entering into a contract with a **state institution** to serve as a member of its medical staff exclusively, if he submits proof that he received in writing a notification by the medical examining board of the state that he possesses the necessary character and professional qualifications.

New York

Bills Introduced.—A. 1033 and S. 826 propose the creation of a temporary state commission to investigate and study the need of a **annual health examination** of all residents of the state. A. 1105, proposes an appropriation to the department of health to defray the cost of research in the cause and cure of **cancer.** A. 1115, to amend the workmen's compensation act, proposes to permit the treatment of injured employee by **podiatrists** in proper cases. A. 1512, proposes regulations for the supervision of operators of shoe fitting **fluoroscopy apparatus.** A. 1592, proposes to make it unlawful for any person to sell furnished or give away a **hypodermic syringe** without the written order of a duly licensed veterinarian or physician. S. 771, proposes to authorize persons holding **professional licenses** and inducted into the armed services prior to July 1, 1952, to have their license **reinstated** within three months after termination of service without examination, reexamination, fine or penalty. S. 790, proposes the creation of a board of **massage** examiners and defines massage as the stroking, tapping or rolling with the hands or with other instrumentalities of the human body for hygenic or remedial purposes, for the purpose of relieving, alleviating or reducing affected parts thereof but shall not include reduction of a fracture or dislocation of a bone. S. 853, proposes to constitute the board of medical examiners as a board of examiners in **physiotherapy.** S. 1108, proposes that every municipal corporation shall assume the liability of any resident physician, intern or other licensed physician or dentist rendering medical service or dental services of any kind to a person without receiving compensation from such person in a public institution or in the course of a home care service maintained by such institution for damages for personal injuries alleged to have been sustained by such person by reason of the **malpractice** of such resident physician, intern or other licensed physician or dentist.

North Dakota

Bills Introduced.—H. 617, proposes the creation of a North Dakota commission on **alcoholism** to study alcoholism and its problems. S. 212, proposes to bring contracts issued by any cooperative, mutual or any other prepaid hospital health plan within the preview of a nineteen-forty-five law requiring that such plans must permit the beneficiaries to consult any doctor licensed to practice in the state and to enter any hospital or sanitarium authorized and organized and operating under the laws of the state.

Oklahoma

Bills Introduced.—H. 135 and H. 136, to amend the motor vehicle code, propose that the drivers license shall contain a statement showing the **blood type** of the licensee. H. 180, to amend the workmen's compensation law, proposes to grant to injured employees the right to be treated by a **physician** or surgeon **of his own choosing.**

Rhode Island

Bill Introduced.—H. 606, proposes to request the director of public health to set up stations manned by trained department of health personnel to give **influenza injections free** of charge to those desiring them.

South Dakota

Bills Introduced.—S. 135, proposes that no person shall be eligible for the office of **coroner** who does not hold a license issued by the state board of medical and osteopathic examiners to practice as a physician. S. 159, proposes to authorize institutions to apply to the state department of health for a **license to obtain animals** from establishments maintained by or for municipalities for the impounding, care and disposal of animals siezed by lawful authority. The institution shall use such animals only in the conduct of its scientific and educational activities and for no other purpose. S. 187, proposes that when there is no **coroner** in a county it shall be the duty of the board of county commissioners to appoint a physician duly licensed by the state board of medical and osteopathic examiners to fill such office.

Tennessee

Bill Introduced.—S. 291, proposes to amend the definition of **chiropractic** contained in the chiropractic act by providing that chiropractic is defined as a system of locating, adjusting and correcting and interference with the transmission of nerve energy, except as herein restricted. Chiropractors licensed under this proposal would be authorized to adjust or manipulate the human body by manual or mechanical methods, or by the use of foods and diet, may apply first aid, and may use x-ray for the purposes of analysis of the spinal column; no chiropractor would be permitted to perform major or minor surgical operations, write prescriptions for medicine, dispense, use or prescribe medicine or narcotic drugs, administer hypodermics, intramuscular or intravenous medication, or use x-ray for any purpose other than analysis of the spinal column.

MEDICAL NEWS

CALIFORNIA

New Medical Center Building.—Construction of the main unit of the Medical Sciences Building at the University of California Medical Center, San Francisco, has begun and is scheduled for completion in about two years. The 14 story building, which will cost over $5,650,000, will be integrated with the new Herbert C. Moffitt Teaching Hospital, on which construction was started last summer. The medical sciences unit will house the offices and laboratories of all four institutions at the center; the schools of medicine and nursing and the colleges of dentistry and pharmacy. The funds being used are part of the $20,080,000 appropriated by the state legislature to bring to the Bay area the nucleus of a modern medical center.

Fatal Case of Botulism.—Dr. Wilton L. Halverson, San Francisco, state director of health, has reported one fatal case of botulism traced to a lot of Liederkranz cheese spread now called off the market. The victim had eaten about two thirds of a jar of the cheese spread; after an incubation period of eight to 10 hours, there were symptoms of nausea and vomiting followed by difficulty in swallowing. A clinical diagnosis of botulism was suggested before the patient died. Examination of the remaining contents of the jar of cheese disclosed toxin and Clostridium botulinum, type B. Records show that this cheese was manufactured in December 1949 and that all of the lot bearing the number which was on the jar described above had been shipped to California. About 40 jars have been recovered, and those which have been examined by the Food and Drug Administration have not shown evidence of botulinus toxin but did reveal the presence of some putrefactive anaerobes which have not been identified. No other cases of botulism are known to have occurred after ingestion of this food. Dr. Halverson also reported a proved case and one suspected case of botulism in another locality, but the source of infection is undetermined, and another case with source unknown in a third locality.

COLORADO

Narcotic Violation.—Dr. Oscar McNay, Ordway, pleaded not guilty to violation of the federal narcotic laws in the U. S. District Court at Denver. On Nov. 27, 1950 he was found guilty on count 2, while count 1 was dismissed by the court. On December 20, after an investigation by the probation officer, he was sentenced to a term of one year and one day.

Heart Disease Program.—The University of Colorado Medical School, the Colorado Heart Association and the State Department of Public Health have planned an intensified heart disease education program. Local physicians will be offered short clinical courses in various aspects of heart disease. Each local medical society has been asked to set up a speakers' bureau on heart disease for P. T. A., civic and service groups. Dr. Edgar Durbin, president of the Colorado Heart Association, is directing the program.

GEORGIA

Personal.—Dr. Alton V. Hallum, Emory University School of Medicine, Atlanta, has been promoted from assistant professor to professor of clinical ophthalmology.

Fulton County Blood Donation Program.—To publicize the need for more blood donors, members of the Fulton County Medical Society and their wives donated more than 125 pints of blood to the Atlanta Red Cross Blood Center February 1. This is believed to be the first time a county medical society has taken such action. A mobile unit of the Red Cross Blood Center was set up in the library of the Academy of Medicine.

Regional Hospital Program.—A program linking Emory University School of Medicine with regional hospitals will begin July 1, when expanded services are offered to Columbus City Hospital in Columbus. The program is financed by a $150,000 grant from the Kellogg Foundation. Dr. Russell H. Oppenheimer, professor of clinical medicine, is in charge of the extension plan. According to city and university officials, the program means a better Columbus hospital, because of additional interns, new technics and educational opportunities that a teaching hospital opens for physicians in the area.

ILLINOIS

Health Talk Wins Award.—Health Talk, the weekly telecast produced by the Educational Committee of the Illinois State Medical Society in association with WGN-TV, won first place honors in the category "Forum and Discussion" in the poll conducted by *Television Forecast*, it was announced February 1. Votes recorded came from the subscribers to the publication. A gold statuette, emblematic of the award, was presented on the telecast February 5 by Robert A. Kubicek, editor of *Television Forecast*. Dr. Harry M. Hedge, Chicago, president, accepted it for the Illinois State Medical Society. Health Talk has been presented as as public service by WGN-TV since Dec. 15, 1948. The program was the first to televise for public viewing the fluoroscopic image of a living heart, the human larynx and the application of a cast.

Gold statuette award.

Chicago

Pediatric Neurology Fellowship.—A fellowship in pediatric neurology is available in the Children's Division of the Cook County Hospital. Information may be obtained from Dr. Abraham Levinson, Chief of Staff, Cook County Children's Hospital, Chicago 12.

Atomic Radiation Effects on Bone Marrow.—Effects of atomic radiation on bone marrow will be investigated by Northwestern University scientists through a $22,275 grant given the university's School of Medicine by the U. S. Air Force. The two year research program will be directed by Dr. Howard L. Alt, associate professor of medicine. He will be assisted by Dr. John A. D. Cooper, Ph.D., assistant professor of chemistry (medical).

Medical Society Meeting.—Two visiting speakers will address members of the Chicago Medical Society February 21 at their meeting at 8: 00 p. m. in the John B. Murphy Memorial Auditorium, after a dinner for the speakers at the Drake Hotel at 5: 30. Dr. Howard F. Root, associate in medicine, Harvard Medical School, and physician in chief, New England Deaconess Hospital, Boston, will speak on "Control of Diabetes." He will be followed by Dr. John S. L. Browne, professor and chairman of the department of medicine, McGill University Faculty of Medicine, Montreal, whose subject will be "Use of ACTH and Cortisone in Various Diseases."

Promotions at Northwestern.—Eight staff members of Northwestern University Medical School have been promoted. Full professorships were given to Dr. Thomas C. Galloway in otolaryngology, to Dr. Harold Augustus Sofield in bone and joint surgery and to Dr. Joseph A. Wells in pharmacology. In

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least two weeks before the date of meeting.

addition to being a member of the Northwestern medical staff, Dr. Sofield is chief surgeon at the Shriners Hospital for Crippled Children, and Dr. Galloway is on the staff of Evanston Hospital. Other promotions include Dr. Louis B. Newman to associate professor of physical medicine, Dr. Louis W. Sauer to associate professor of pediatrics, Dr. Eugene S. Talbot Jr. to associate professor of medicine, Dr. John E. Kearns Jr. to assistant professor of surgery and Dr. Theron G. Randolph to associate in medicine.

KANSAS

Kansas Regional Meeting.—The Kansas regional meeting of the American College of Physicians will be held in Wichita on March 16. Dr. William C. Menninger, Topeka, is the college governor for Kansas. The scientific session, which begins at 10:30 a. m. in the Allis Hotel, includes the following invited speakers:

Bert E. Stofer, Wichita, Cytological Diagnosis, with Particular Emphasis on Carcinoma of the Lung.
Robert E. Bolinger, Kansas City, Effects of ACTH in Liver Disease.
E. Grey Dimond, Kansas City, The Torsion Ballistocardiograph.

After the scientific session, an informal dinner will be held. The guest speaker will be Dr. William S. Middleton, Madison, Wis., president of the college.

MARYLAND

Annual Hospital Lecture.—The annual lecture of the Sinai Hospital staff in Baltimore will be held March 22. The speaker will be Dr. Arthur M. Master, New York, who will lecture on "Diagnosis and Treatment of Acute Coronary Insufficiency."

MASSACHUSETTS

Postgraduate Anesthesiology.—The remaining lectures of the postgraduate course of the Massachusetts Society of Anesthesiologists are as follows:

March 3, Pathology of the Respiratory System and the Physiology Which Would Influence the Conduct of Anesthesia, Dr. William S. Derrick, Boston, chairman.
April 7, Pathology of Deaths Related to Anesthetic Agents, Dr. Henry K. Beecher, Boston, chairman.

The course lectures are held in Bigelow Auditorium of Massachusetts General Hospital, Boston, from 2: 30 to 5: 00 p. m. The fee is $5.

Cutter Lecture.—Dr. Hugh M. Sinclair, British nutritionist, delivered the sixty-eighth Cutter Lecture on Preventive Medicine under sponsorship of the Harvard School of Public Health at 5:00 p. m. February 9 in Amphitheater E of the Harvard Medical School, Boston. His topic was "Nutrition Surveys of Population Groups." Dr. Sinclair directs the Laboratory of Human Nutrition at University of Oxford, England. Following World War II he conducted nutrition surveys of some 100,000 persons in the Netherlands and in Germany. The Cutter Lectures have been conducted as a series at Harvard since 1912, under a bequest by the late Dr. John C. Cutter, who specified in his will that "the lectures shall be delivered in Boston, and shall be free to the medical profession and to the press."

MISSISSIPPI

Students Receiving Medical Education Loans.—Twenty-two state medical education loan recipients entered the University of Mississippi School of Medicine on January 29. These students were recently approved by the State Medical Education Board for such loans, the purpose of which is to obtain more doctors for the rural areas by assisting deserving young people of the state to meet the costs of medical education. This group brings the total number of students now receiving medical education loans at the University of Mississippi School of Medicine to 86. The remainder of the 219 loan recipients now attending school are enrolled in 23 other medical schools throughout the United States. Students who entered the state's two year medical school at Oxford are residents of 17 communities in 15 counties. They have completed premedical courses. Eleven of them are veterans of World War II.

NEW YORK

Postgraduate Instruction.—Dr. Charles A. Ragan, assistant professor of medicine, Columbia University College of Physicians and Surgeons, New York, will address the Binghamton Academy of Medicine February 20 at 8:30 p. m. at the Binghamton City Hospital. This instruction is provided by the Medical Society of the State of New York with the cooperation of the New York State Department of Health.

Mental Disease Among the Aged.—An intensive research program to discover what conditions are associated with mental disease among the aged was inaugurated January 23 by the New York State Mental Health Commission in cooperation with the Council on Aging of the Council of Social Agencies in Syracuse. The Syracuse research unit of the commission will concentrate on studying experiences of older people in Onondaga County and the forces influencing their mental health. The project will also include a statistical study of the influence of social and economic factors on the mental health of the aged. A survey of local agencies has been started by the council to determine the extent of their services and where they need strengthening.

The Syracuse research project, of which this study is the first phase, is a pilot experiment to obtain information that can be used to formulate a master mental health plan for communities throughout the state. The following persons will act as consultants to the project: Dr. Frederick C. Redlich, professor of psychiatry, and Prof. A. B. Hollingshead, department of sociology, Yale University, New Haven, Conn.; John Claussen, social scientist, National Institute of Mental Health, Bethesda, Md.; Alexander H. Leighton, professor of sociology, Cornell University, New York, and F. C. Richardson, Harvard University, Boston.

New York City

Personals. — Dr. Milton J. Matzner, Brooklyn, has been appointed attending gastroenterologist in charge of gastroenterology at the Jewish Hospital of Brooklyn.——Dr. Howard Fox has recently been made a corresponding member of the Swedish Dermatological Society.

Internships and Residencies Bulletin.—The New York Committee on the Study of Hospital Internships and Residencies on December 15 published the first issue of *The Bulletin.* The main purpose of this monthly will be to disseminate information to member hospitals and organizations connected with it. It was originated by Dr. Frode Jensen, new director to the House Staff Educational Plan, who will also serve as editor. Announcements of various types, such as intern and resident vacancies and of candidates seeking appointments, will be given from time to time.

Course in Exfoliative Cytology.—Instead of the two week course in exfoliative cytology under the direction of Dr. George N. Papanicolaou (announced in THE JOURNAL Dec. 9, 1950), a three month course will be given March 5-May 31. This course is open to a limited number of doctors and selected technicians. It will cover the cytology of the female genital, gastrointestinal, respiratory and urinary tracts. Tuition is $300. Arrangements for shorter periods of instruction covering all or certain applications of exfoliative cytology may be made for those who cannot come for the entire three months. Applications may also be submitted for the study of cytological material for varying lengths of time during the rest of the year, except during July and August. The tuition in these cases will depend on the length of time desired for training. Information may be obtained from Dr. George N. Papanicolaou, Department of Anatomy, Cornell University Medical College, 1300 York Avenue, New York 21.

Hospital Building Program.—Roosevelt Hospital's $11,000,000 expansion program will get under way in April 1951, when construction begins on the Tower Memorial Building. The new five story building and basement were made possible from

initial funds of the Maria B. and Joseph T. Tower Trust, plus grants and bequests designated by the trustees for construction, and aid from the government under Public Law 725. The project will enable Roosevelt Hospital to increase its service to the community by providing urgently needed facilities for ambulatory patients in Manhattan. The Roosevelt clinics are designed for multiple use so that clinics requiring similar types of facilities may occupy the same space at different times. The Dr. Robert A. Cooke Institute of Allergy and the allergy clinic and laboratories will occupy the fourth floor. The fifth floor will be divided between the department of physical medicine and the clinics for eye, ear, nose and throat, and dentistry. In addition to the five story Tower Memorial Building, which eventually will be enlarged to an 11 story building, future plans for Roosevelt Hospital include a maternity and gynecological building, nurses' residence and training school and an auditorium and gymnasium.

PENNSYLVANIA

Dauphin County Radio Programs.—The Dauphin County Medical Society has a consistent record of maintaining, for the past three years, a weekly "live" radio program, "Your Doctor Speaking," over WHGB, Harrisburg. The state medical society originated the doctor-moderator type of medical broadcast in Harrisburg and conducted it for one year.

Personals.—Dr. Persis S. Robbins, of Bradford, for 15 years secretary and treasurer of the McKean County Medical Society, retired from this position recently and was honored by her confreres at the society's annual dinner in Bradford.——Dr. William W. Rosensweig, Wilkes-Barre, took over the editorship of the *Luzerne County Medical Bulletin* on January 1.——Dr. Jess V. Cohn, formerly assistant superintendent of Central State Hospital, Indianapolis, in November became medical superintendent of the State Hospital at Embreeville.

Philadelphia

Hospital Clinical Conference.—The third annual Clinical Conference of the Staff and Ex-Residents of Wills Hospital will be held at the hospital March 16-17. The Arthur J. Bedell Lecture will be delivered by Dr. Conrad Berens of New York.

Gifts to Hahnemann College.—The Hahnemann Medical College and Hospital of Philadelphia has received a number of bequests, gifts and grants, and among them is an anonymous bequest of $10,000 to aid students doing research during summer months. A bequest of $23,000 from the estate of Rose Klain Netter is for maintenance of and new equipment for the department of physical therapy. The Anna and Charles J. White Research Fund in biochemistry made a gift of $2,400 to be used for the purchase of biochemistry equipment, and the Richard P. McNeeley Fund for the Division of Medicine made a grant of $7,300 for clinical investigation of steroid compounds in rheumatic diseases. Pharmaceutical companies have made the following grants: Meade Johnson & Company, $1,000 for clinical research in problems of infant feeding; Mennen Company, $1,000 for a six months' study of the effects of preparations on the skin of newborn infants; Commercial Solvents Corporation, $2,000 to the division of biological chemistry for research in arteriosclerosis; Wyeth, Inc., $3,000 for research in clinical medicine and therapeutics, and National Drug Company, $1,000 to the department of gastroenterology for research.

TEXAS

University Appointments.—M. Mason Guest, Ph.D., has accepted appointment as professor of physiology at the University of Texas Medical Branch, Galveston. Dr. Guest comes to Texas from Wayne University College of Medicine, Detroit. He had taught at Columbia University College of Physicians and Surgeons, New York, before joining the U. S. Air Force in charge of research studies at a special facility in Arizona during the war. Dr. William M. Shanahan, formerly of the University of Chicago, has accepted appointment as professor of psychiatry and director of the Galveston State Psychopathic Hospital. Dr. Shanahan was formerly director of the Division of Mental Hygiene of the Hawaii Territorial Health Department. Dr. William A. Cantrell has been appointed assistant professor of psychiatry. Dr. Elmer L. Bruce Jr. has been appointed assistant professor of psychiatry and assistant director of the Galveston State Psychopathic Hospital. Both took residency training at the university. Frank B. Engley Jr., Ph.D., has been appointed associate professor of bacteriology. During the war he served as bacteriologist in the Chemical Corps at Camp Detrick.

UTAH

Cancer Symposium.—On March 1-2, the Fourth Utah Cancer Symposium will be presented by the University of Utah Medical School, in conjunction with the Utah Chapter of the American Cancer Society, the Utah state department of health and the Utah State Medical Association. The scientific sessions will be held in the Amphitheater of the Nurses Home of the Holy Cross Hospital, Salt Lake City. Information will be presented in the form of clinics, seminars, talks, conferences, teaching movies and round tables. Dr. Louis A. Buie, from Rochester, Minn., will discuss rectal lesions. Dr. Charles Huggins, Chicago, will discuss the problem of prostatic cancer as it presents itself to the general practitioner and conduct a seminar on cancer tests. Dr. Ralph F. Bowers, Memphis, Tenn., will discuss gastric cancer, together with Dr. Lauren V. Ackerman, St. Louis. Dr. L. Henry Garland, San Francisco, will present the radiologist's aspect of roentgenograms. Dr. Allen Barnes, Columbus, Ohio, will discuss advances in late cancer therapy. Of interest will be round tables on early cancer diagnosis and on late cancer therapy. The moderators in these discussions will be Dean John Z. Bowers, Salt Lake City, and Dr. Maxwell M. Wintrobe, Salt Lake City; the discussers will be the guest speakers.

WEST VIRGINIA

Personals.—Dr. David C. Prickett, Shinnston, has been named health officer for District 4 with headquarters at Weston.——Dr. Lyle J. Roberts, who was released from the Navy January 1 with the rank of captain, has been named health officer for District 6 with headquarters at Martinsburg.

County Pediatric Clinic.—The second demonstration pediatric clinic in West Virginia opened February 1 at the Monongalia County Health Center in Morgantown. The Kanawha-Charleston Health Department, in cooperation with the Kanawha County Board of Education, instituted a demonstration pediatric clinic in Charleston two years ago. The success of this clinic stimulated the opening of the second one in Morgantown. The clinic has the approval of the Monongalia County Medical Society. The two clinicians serving the clinic offered their services free. In addition, a part time medical social worker and nutritionist will assist at this weekly clinic.

WISCONSIN

County Society Entertains Druggists.—Manitowoc County Chapter of the American Academy of General Practice had as guests the druggists of the county at a meeting in Manitowoc January 4. Clem O. Miller, Ph.D., and Adrian Kameraad, Ph.D., both of Milwaukee, spoke on "Quality Control of Drugs."

Anniversary Dinner for Dr. Schmidt.—Twenty-nine of the 44 doctors who received their surgical residency training under Dr. Erwin R. Schmidt at the Wisconsin General Hospital met in Madison January 18 to honor Dr. Schmidt on his twenty-fifth anniversary as professor of surgery at the University of Wisconsin Medical School. An operative clinic was held in the morning, and in the afternoon six clinical papers were read. The guest speaker at the dinner was Prof. William H. Kiekhofer, university economist, who was a former teacher of Dr. Schmidt. A sterling silver tray inscribed with the names of the 44 doctors was presented to Dr. Schmidt.

GENERAL

WHO Western Pacific Meeting Postponed.—The World Health Organization's executive board, in session at Geneva, decided to postpone the first meeting of WHO's Regional Committee for the Western Pacific pending improvements in the international situation. A meeting had been scheduled in March for setting up a permanent regional organization to include China, Viet Nam, Cambodia, Laos, Korea, the Philippines, Australia, New Zealand and trust territories in the Pacific. A temporary office for the region is now maintained in Hong Kong.

Low Influenza Incidence in the United States.—The U. S. Public Health Service reports that for the week ended January 27, the number of cases of influenza for the country as a whole remained low, 1,788 cases as compared with 6,336 for the same week last year. The influenza-like infection reported in Gordo, Ala., the previous week was mild. Material for isolation of virus was obtained from only four of the 250 cases reported to have occurred. The actual number of cases appears to have been overestimated. No unusual amount of respiratory disease has been noted in nearby communities.

Interurban Neurosurgical Society—This society will hold its annual meeting at the University Club, Chicago, February 24 beginning at 9:00 a. m. The program is as follows:

J. Grafton Love, Rochester, Minn., End Results of Pituitary Adenomas.
Francis Murphey, Memphis, Tenn., Treatment of Intracranial Aneurysms.
Henry T. Wycis, Ernest A. Spiegeland, Philadelphia, Stereoencephalotomy.
Paul C. Bucy, Chicago, Complete vs. Intracapsular Enucleation of Acousticus Tumor.

The meeting is for members and their invited guests.

Occupational Therapists Examinations.—The Illinois Civil Service Commission has announced nationwide examinations for occupational therapist I and II for employment with the state of Illinois. Final application date is March 23. Desirable qualifications include college graduation, with a major in occupational therapy, art, or home economics. Professional experience in occupational therapy work may be substituted year for year for the college training. Occupational therapists perform professional work in the treatment and rehabilitation of patients in Illinois state hospitals or schools. Salaries range from $190 to $319. Information may be obtained from the Illinois Civil Service Commission, 501 Armory Building, Springfield, Ill.

Life Expectation of Wage Earners.—The expectation of life at birth among American wage earners and their families rose to an all-time high of 68.2 years in 1950, according to Dr. Louis I. Dublin, chief statistician of the Metropolitan Life Insurance Company. This is a half-year higher than in 1949. The expectation of life has increased 21½ years in the past four decades and has doubled in little more than two generations. Progress in extending the average length of life has been more rapid in the industrial population than in the population as a whole. Forty years ago the expectation of life at birth among the industrial policy holders of the metropolitan was about 6½ years less than in the general population of the United States, whereas now the figures are practically the same for both groups.

Program for Prevention and Treatment of Alcoholism.—A program was outlined last December in Geneva by the World Health Organization's Committee of Experts for the prevention and treatment of alcoholism. The committee's first recommendation was that alcoholism should be treated along medical and scientific lines unconfused with political and social action against the use of alcohol. It was recommended that treatment must be through a medical approach, devoid of any implications of moral censure, backed by psychotherapy and social work. Important new drugs, when used by qualified physicians were considered valuable in well chosen cases. The committee pointed out that no existing drug is a cure for alcoholism but can only aid in treatment. The lack of commonly accepted terminology was called by the experts a serious obstacle to international action. They defined alcoholism as "any form of drinking which in extent goes beyond traditional customary dietary use or ordinary compliance with social drinking customs of the whole community concerned." The committee confirmed various sources showing the number of alcoholics suffering complications in the following countries: Switzerland, 50,000; Chile, 43,000; France, 375,000; Yugoslavia, 90,000; United States, 945,000; Australia, 34,300; Sweden, 30,800; Italy, 135,800; Norway, 8,400; Finland, 8,800 and England and Wales, 86,000.

Central Surgical Association Meeting.—The annual assembly of this association will be held February 22-24 with headquarters at the Drake Hotel, Chicago, under the presidency of Dr. Walter G. Maddock, Chicago. The Invitation Clinic Day, February 22, is scheduled for Albert Merritt Billings Hospital in the morning and the University of Illinois in the afternoon. Those delivering papers by invitation include:

John M. Hammer, Kalamazoo, Mich., Effect of a Cervical Arteriovenous Fistula Observed on a Series of 25 Patients.
Johann L. Ehrenhaft, Iowa City, Pulmonary Resections for Metastatic Lesions.
Harold F. Berg, Louisville, Ky., Surgical Approaches for Localization of Radioactivity Using Colloidal Gold^{198}.

The dinner dance at 7:45 p. m. will follow the reception at 6:30 p. m.

Meeting of Academy of Forensic Sciences.—The annual meeting of the American Academy of Forensic Sciences will be held March 1-3 at the Drake Hotel, Chicago, under the presidency of Dr. Rutherford B. H. Gradwohl, St. Louis. The 29 scientific papers to be presented at the general sessions deal with infant deaths, autopsies, carbon monoxide poisoning, obscure murder cases, plastics and medicolegal evidence, industrial poisons, paternity tests, crime detection apparatus, procedures and technics and other medicolegal subjects. Section meetings on Friday morning include: Toxicology: "The Toxicologist's Approach to the Analysis of a General Unknown"; Pathology: Round table on "The Medicolegal Autopsy"; Psychiatry: Subject to be announced. The annual banquet will be held Friday at 7:00 p. m.

Regional Physicians Meeting.—The Regional Meeting of the American College of Physicians for Maryland and the District of Columbia is being held in Washington, D. C., February 17 in the auditorium of the Medical Society of the District of Columbia under the general chairmanship of Dr. John Minor, college governor for the District of Columbia. All physicians in the Baltimore and Washington areas are welcome to attend the scientific session. Among the guests are Dr. William S. Middleton, Madison, Wis., president of the college; Dr. Maurice C. Pincoffs, president-elect; Major Gen. Harry G. Armstrong, Major Gen. Raymond W. Bliss, Rear Admiral Clifford A. Swanson, college governors for the U. S. Air Force, Army and Navy, respectively, and Dr. Arden Freer, acting college governor for the Veterans Administration.

Standard Oil Medical Research Division.—To study potential health hazards in the manufacture and use of new chemical products made from petroleum, Standard Oil Company (New Jersey) has announced that its medical research division will inaugurate a broad program of increased activities. New information obtained on toxic materials will be made available immediately to the medical profession. The division was transferred from the Medical Department of Jersey Standard to its central research affiliate, the Standard Oil Development Company, on February 1. The reorganized medical research division will be headed by Dr. Robert E. Eckardt, medical research director, and will be located at the Esso Research Center, Linden, N. J. The division will work with the University of Cincinnati, the New York University-Bellevue Medical Center, the Albany Medical College and the Sloan-Kettering Institute on toxicity studies.

Training in Placement of the Handicapped.—A four week training course for employment and placement counselors working with cerebral palsied and other handicapped workers will be held March 12 through April 6 in New York. The course is offered under the sponsorship of the Alpha Gamma Delta International Women's Fraternity and the National Society for Crippled Children and Adults, and will be given at the Institute of Rehabilitation and Physical Medicine of the

New York University-Bellevue Medical Center. On satisfactory completion of the course, six hours of graduate credit in education will be granted by the university. Ecah year Alpha Gamma Delta and the National Society grant between 15 and 20 fellowships amounting to $300 each, including tuition and maintenance. Others wishing to attend the course on a nonfellowship basis may secure information from the National Personnel Registry and Employment Service of the National Society for Crippled Children and Adults, 11 South LaSalle Street, Chicago 3.

Vacancies for Psychiatrists.—To assist the states in filling some vacancies, the U. S. Public Health Service has compiled the following list of vacancies. *Florida:* Psychiatrist to direct state mental health program; salary $7,200. Two staff psychiatrists (Tallahassee and Daytona Beach) for state mental health program. Information may be obtained from Dr. Wilson T. Sowder, State Health Officer, Jacksonville, Fla. *Georgia:* Psychiatrist. Information may be obtained from Dr. T. F. Sellers, Director, Department of Public Health, State Office Building, Atlanta, Ga. *Minnesota:* Psychiatrist for mental health programs, vacancies in nine state hospitals. Salaries range from $7,236 to $9,396. Information may be obtained from the Minnesota Civil Service Department, 122 State Office Building, St. Paul. *Tennessee:* Psychiatrist, full time director, Division of Mental Hygiene, State Health Department. Candidates must be willing to come to Tennessee for personal interview at their own expense. Information may be obtained from Dr. R. H. Hutcheson, Commissioner of Public Health, Nashville, Tenn.

Program in Industrial Health Practices.—An orientation program in industrial health practices will be presented by the Carbide and Carbon Chemicals Division of the Union Carbide and Carbon Corporation at the Oak Ridge National Laboratory, Oak Ridge, Tenn., February 24. The program, arranged for the Council on Industrial Health of the American Medical Association, is as follows:

Mr. T. E. Lane, Interest of the Industrial Relations Division in Industrial Health.
Mr. C. E. Larson, Role of the Oak Ridge National Laboratory.
Mr. W. B. Humes, Role of the Gaseous Diffusion Plant.
Mr. W. D. Lavers, Role of the Electromagnetic Plant.
Richard H. Rucker, Role of the Office of Research and Medicine, AEC.
Charles R. Sullivan Jr., Industrial Health Program at the Electromagnetic Plant.
Joseph S. Lyon, Industrial Health Program at the Gaseous Diffusion Plant.
Jean S. Felton, Industrial Health Program at the Oak Ridge National Laboratory.
Mr. W. H. Bauman, Health Protective Measures in Beryllium Workers.
Mr. H. J. McAlduff Jr., Health Physics Program at the Oak Ridge National Laboratory.

A film on "Engineering for Radio Isotopes" will be shown at the end of the morning session. A tour of the dispensary and pile building and of the radioisotope area will be made in the afternoon.

Second International Poliomyelitis Conference.—The Second International Poliomyelitis Conference has been scheduled for September 3-7 at the Medicinsk-Anatomisk Institute of the University of Copenhagen in Denmark. The sponsors are The National Foundation for Infantile Paralysis of the United States and the Danish National Association for Infantile Paralysis. Presiding president of the conference is Prof. Niels Bohr of Copenhagen. The tentative program of the five day meeting includes 32 papers and discussions on the general headings: "Virus and Its Interaction with the Host Cells," "Pathology and Pathophysiology of Poliomyelitis," "The Coxsackie Group of the Viruses," "Differential Diagnosis in Acute Poliomyelitis," "Treatment of Poliomyelitis," "Immunity and Resistance in Poliomyelitis and Other Virus Infections" and "Ecology of Poliomyelitis." The program also includes scientific and technical exhibits and clinical demonstrations of methods of treatment in the acute stage as well as the aftereffects. The conference plans to hold seven scientific sessions during the five day meeting and ample time is being allowed for discussions on each paper. Papers will be delivered in English, French, German or Spanish. Arrangements are being made for simultaneous interpretations, using IBM equipment, such as that employed by the United Nations. The Danish Royal Ministry for Foreign Affairs is extending invitations to 60 nations to send official delegates to the conference. Physicians and scientists interested in poliomyelitis are invited to attend. The conference will invite representatives of societies and organizations interested in research and treatment of virus diseases. Transportation and currency arrangements are being facilitated by Thomas Cook & Son, Wagon-Lits-Cook, and the American Express Company. The Swedish-American Lines are making available the *MS Stockholm,* which is scheduled to leave New York on August 25 and to arrive at Copenhagen on September 2. Requests for hotel accommodations and information concerning the conference may be obtained from the Secretariat of the Second International Poliomyelitis Conference, Statens Seruminstitut, 80 Amager Boulevard, Copenhagen, Denmark. The telegraphic address is Poliocon, Copenhagen.

Accident Toll for 1950.—The National Safety Council, Chicago, reports that 90,000 persons were killed in accidents during 1950 and 8,900,000 were injured. This huge toll represents a saving of 1,000 lives from the 1949 total. Motor vehicle accidents led the list as the nation's greatest accident killer, with home accidents second. Although occupational deaths increased slightly as a result of greater employment, home accident deaths and those occurring in public places not involving a motor vehicle decreased more than enough to offset the increase in traffic deaths. The 1950 all-accident death rate was 59.9 per 100,000 population, the lowest since the previous low of 61.2 in 1949. Nevertheless, one out of every 17 persons in the United States suffered a disabling injury in 1950. The estimated economic loss of $7,700,000,000 from accidents in 1950 covers both fatal and nonfatal accidents and includes wage losses, medical expense and overhead costs of insurance for all accidents, production delays, damage to equipment in occupational accidents and property damage from traffic accidents and fires.

Falls brought death to 18,600 persons in 1950, 13 per cent fewer than in 1949; deaths from burns 7,000, an 8 per cent increase from 1949; drownings 6,100, a 9 per cent decrease, and firearms deaths dropped 11 per cent to 2,100. Three catastrophes in 1950 caused more than 50 deaths each: The November wind and snow storm in the northeastern states, the collision of two suburban trains in New York and the crash of a scheduled air transport plane into Lake Michigan. Eight other catastrophes caused between 25 and 50 deaths.

In addition to the fatalities, 1950 traffic accidents caused about 1,225,000 nonfatal injuries and a property valuation loss estimated at $1,200,000,000. All costs, including medical expenses, overhead costs of insurance and motor vehicle property damage, were $3,300,000,000. Of the 45 states that reported their complete motor vehicle death toll, North Dakota led the five reporting decreases from 1949 with a decrease of 25 per cent. Among cities with more than 200,000 population, Atlanta, Ga., had the largest reduction in fatalities, 37 per cent below 1949. Dayton, Ohio, was next with a 26 per cent drop, and Syracuse, N. Y., followed with a 21 per cent decrease. Forty-five cities of 10,000 population or more completed the year without a traffic death. Brookline, Mass., with a population of 57,000, was the largest city to achieve this record. Berwyn, Ill., was second and White Plains, N. Y., was third. The home accident death total was about 27,500, an 11 per cent decrease from 1949. Disabling injuries from home accidents numbered 4,100,000, and wage loss, medical expense and the overhead costs of insurance totaled about $550,000,000. Coal mine deaths rose to 637 in 1950, 7 per cent more than the 1949 figure. Railroad employee fatalities were 209 in the first eight months, a decrease of 22 per cent, and injuries for eight months were down 14 per cent to a total of 13,321. Deaths to workers from all accident causes totaled 49,500—15,500 on the job and 34,000 off the job. This is a 6 per cent increase from 1949. Injuries were about 4,550,000, representing a total time loss of 410,000,000 man-days.

CORRECTION

Optimum Dose of Vitamin D in Pregnant Women and the Newborn.—In the item under this title in the Paris letter in THE JOURNAL, Nov. 18, 1950, page 1019, thirteenth line, "100 Gm." should have been "1,000 Gm."

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. D. G. Gill, 519 Dexter Ave., Montgomery.

ALASKA:* Juneau, March 13. Qualified applicants may request a special examination in other towns where board members are located. Sec., Dr. W. M. Whitehead, Box 140, Juneau.

ARKANSAS: * *Regular.* Little Rock, June 7-8. Sec., Dr. Joe Verser, Harrisburg. *Homeopathic.* Fort Smith, June 7-8. Sec., Dr. Carl S. Bungart, 105 N. 14th St., Fort Smith. *Eclectic.* Little Rock, June 7-8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written.* Los Angeles, Feb. 26-March 1. *Oral.* Los Angeles, Feb. 24. *Oral and Clinical for Foreign Medical School Graduates.* Los Angeles, Feb. 25. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

CONNECTICUT: * *Examination.* Hartford, March 13-14. Sec. to the Board, Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic.* Derby, March 13-14. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

FLORIDA:* *Examination.* Jacksonville, June 24-26. Sec., Dr. Homer L. Pearson, 701 DuPont Bldg., Miami.

GEORGIA: Atlanta, June. Augusta, June. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. John Y. Battenfield, Agana.

INDIANA: Indianapolis, June 20-22. Exec. Sec., Miss Ruth V. Kirk, 1138 K. of P. Bldg., Indianapolis 4.

IOWA: * *Written.* Iowa City, June 11-13. Sec., Dr. M. A. Royal, 506 Fleming Bldg., Des Moines.

KANSAS: Kansas City, June 6-7. Sec., Dr. O. W. Davidson, 864 New Brotherhood Building, Kansas City.

KENTUCKY: Louisville, June 6-8. Sec., Dr. Bruce Underwood, 620 S. 3rd St., Louisville.

MAINE: Portland, March 12-13. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: Baltimore, June 19-22. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore 1. *Homeopathic.* Baltimore, June 19-20. *Examination.* Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Jackson 113.

MISSOURI: *Examination.* Jefferson City, Feb. 19-21. *Reciprocity.* Jefferson City, Feb. 12. Ex. Sec., Mr. John A. Hailey, Box 4, Jefferson City.

MONTANA: Helena, April 2-4. Sec., Dr. S. A. Cooney, 214 Power Block, Helena.

NEBRASKA: * June 1951. Director, Mr. Oscar F. Humble, Room 1009, State Capitol Bldg., Lincoln.

NEVADA: Carson City, Feb. 5. Sec., Dr. George H. Ross, 112 Curry St., Carson City.

NEW HAMPSHIRE: *Examination.* Concord, March 14-15. Sec., Dr. John S. Wheeler, 107 State House, Concord.

NEW JERSEY: *Examination.* Trenton, June 19-22. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. Charles J. McGoey, Coronado Bldg., Santa Fe.

NORTH CAROLINA: *Endorsement.* Pinehurst, May 7. *Examination,* Raleigh, June 18-21. Sec., Dr. Joseph J. Combs, 419 Professional Bldg., Raleigh.

OHIO: *Endorsement.* Columbus, April 3. Sec., Dr. H. M. Platter, 21 W. Broad Street, Columbus.

OKLAHOMA: * *Examination.* Oklahoma City, June 6-7. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

PUERTO RICO: *Examination.* Santurce, March 6. Sec., Mr. Luis Cueto Coll, Box 3717, Santurce.

SOUTH CAROLINA: *Reciprocity.* Columbia, Feb. 5, March 5, April 2. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

TEXAS:* *Examination.* Austin, June 14-16. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: Salt Lake City, July 1951. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

VERMONT: Burlington, February 1951. Sec., Dr. F. J. Lawliss, Richford.

VIRGIN ISLANDS: St. Thomas, June 12. Sec., Dr. Earle M. Rice, St. Thomas.

WYOMING: *Examination.* Cheyenne, Feb. 5. Sec., Dr. Franklin D. Yoder, Capitol Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: *Examination.* Juneau, February, or when qualified candidates make application. Sec., Dr. C. Earl Albrecht, Box 140, Juneau.

ARIZONA: *Examination.* Tucson, March 20. Sec., Mr. Francis A. Roy, Room 427, Liberal Arts Bldg., University of Arizona, Tucson.

ARKANSAS: *Examination.* Little Rock, May 8-9. Sec., Mr. L. E. Gebauer, 1002 Donaghey Bldg., Little Rock.

COLORADO: *Examination.* Denver, March 7-8. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 3.

CONNECTICUT: *Examination.* Feb. 10. Executive Asst., State Board of Healing Arts, Mr. M. G. Reynolds, 110 Whitney Ave., New Haven 10.

DISTRICT OF COLUMBIA: *Examination.* April 23-24. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

FLORIDA: *Examination.* Gainesville, June 2. Sec., Mr. M. W. Emmel, University of Florida, Gainesville.

OKLAHOMA: *Examination.* Oklahoma City, March 27. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON: *Examination.* Portland, March 3. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: *Examination.* Providence, Feb. 14. Chief, Division of Professional Regulation, 366 State Office Bldg., Providence.

SOUTH DAKOTA: *Examination.* Vermillion, June 15-16. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.

TENNESSEE: *Examination.* Memphis, March 14-15. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

TEXAS: *Examination.* Latter Part of April. Sec., Bro. Raphael Wilson, 306 Nalle Bldg., Austin.

WISCONSIN: *Examination.* Madison, April 7. Sec., Mr. W. H. Barber, Scott and Watson Sts., Ripon.

* Basic Science Certificate required.

MEETINGS

ANNUAL CONGRESS ON INDUSTRIAL HEALTH, Atlanta Biltmore Hotel, Atlanta, Ga., Feb. 26-28. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.

NATIONAL CONFERENCE ON RURAL HEALTH, Peabody Hotel, Memphis, Tenn., Feb. 23-24. Dr. F. S. Crockett, 535 N. Dearborn St., Chicago 10, Chairman.

AMERICAN ACADEMY OF FORENSIC SCIENCES, Drake Hotel, Chicago, March 1-3. Prof. Ralph F. Turner, Michigan State College Dept. of Police Administration, East Lansing, Mich., Secretary.

AMERICAN ACADEMY OF GENERAL PRACTICE, San Francisco, March 19-22. Mr. Mac F. Cahal, 406 W. 34th St., Kansas City 2, Mo., Executive Secretary.

AMERICAN ACADEMY OF NEUROLOGY, Cavalier Hotel, Virginia Beach, Va., April 11-13. Dr. Joe R. Brown, Mayo Clinic, Rochester, Minn., Secretary.

AMERICAN ASSOCIATION OF ANATOMISTS, Detroit, March 21-23. Dr. Normand L. Hoerr, 2109 Adelbert Road, Cleveland 6, Secretary.

AMERICAN ASSOCIATION OF RAILWAY SURGEONS, Drake Hotel, Chicago, April 3-5. Dr. Chester C. Guy, 5800 Stony Island Ave., Chicago 37, Secretary.

AMERICAN COLLEGE OF PHYSICIANS, Cleveland, April 21-25. Mr. E. R. Loveland, 4200 Pine St., Philadelphia 4, Executive Secretary.

AMERICAN CONGRESS ON OBSTETRICS AND GYNECOLOGY, Hotel Netherlands Plaza, Cincinnati, March 31-April 4. Mr. Donald F. Richardson, 116 S. Michigan Ave., Chicago 3, Executive Secretary.

AMERICAN SURGICAL ASSOCIATION, Washington, D. C., April 11-13. Dr. Nathan A. Womack, University Hospitals, Iowa City, Secretary.

CENTRAL SURGICAL ASSOCIATION, Chicago, Feb. 22-24. Dr. James T. Priestley, Mayo Clinic, Rochester, Minn., Secretary.

CHICAGO MEDICAL SOCIETY ANNUAL CLINICAL CONFERENCE, Palmer House, Chicago, March 6-9. Dr. Walter C. Bornemeier, 30 N. Michigan Blvd., Chicago 2, Secretary.

CONFERENCE ON CHRONIC DISEASE—PREVENTIVE ASPECTS, Edgewater Beach Hotel, Chicago, March 12-14. Dr. Morton L. Levin, 535 N. Dearborn St., Chicago, Director.

MICHIGAN POSTGRADUATE CLINICAL INSTITUTE, Book-Cadillac Hotel, Detroit, March 14-16. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Secretary.

MID-CONTINENT PSYCHIATRIC ASSOCIATION, Kansas City, Mo., March 31-April 1. Dr. Paul Hines, 2625 W. Paseo, Kansas City, Mo., Secretary.

NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS, Hotel New Yorker, New York, March 28-30. Dr. Franklin M. Foote, 1790 Broadway, New York 19, Executive Director.

NEW ORLEANS GRADUATE MEDICAL ASSEMBLY, Municipal Auditorium, New Orleans, March 5-8. Dr. W. D. Beacham, 1430 Tulane Ave., New Orleans 12, Secretary.

SOUTHEASTERN SECTION, AMERICAN UROLOGICAL ASSOCIATION, Peabody Hotel, Memphis, Tenn., March 7-10. Dr. Russell B. Carson, Sweet Bldg., Fort Lauderdale, Fla., Secretary.

SOUTHEASTERN SURGICAL CONGRESS, Hollywood Beach Hotel, Hollywood, Fla., April 11-14. Dr. Benjamin T. Beasley, 45 Edgewood Ave. S.E., Atlanta 3, Ga., Secretary.

SOUTHWEST ALLERGY FORUM, San Antonio, Texas, April 8-10. Dr. Boen Swinney, 224 Medical Arts Bldg., San Antonio 5, Secretary.

TENNESSEE STATE MEDICAL ASSOCIATION, Nashville, April 9-11. Dr. R. H. Kampmeier, Vanderbilt University Hospital, Nashville, Secretary.

UNITED STATES-MEXICO BORDER PUBLIC HEALTH ASSOCIATION, Los Angeles, April 4-6. Dr. M. F. Haralson, 314 U. S. Court House, El Paso, Texas, Secretary.

International

INTERNATIONAL CONGRESS OF ORTHOPEDIC SURGERY AND TRAUMATOLOGY, Stockholm, Sweden, May 21-25. Sten Friberg, Karolinska Instituts Ortopediska Klinik, Stockholm, Congress Secretariat.

PAN AMERICAN CONGRESS ON MEDICAL EDUCATION, Lima, Peru, May 14-18. Dr. Carlos F. Krumdieck, Washington 914, Lima, Secretary General.

DEATHS

Wood, Francis Carter ⊕ New York, died in the Englewood Hospital, Englewood, N. J., January 5, aged 81, of coronary thrombosis. Dr. Wood was born at Columbus, Ohio, Dec. 30, 1869. He received his bachelor's degree at Ohio State University, Columbus, in 1891, and graduated at Columbia University College of Physicians and Surgeons, New York, in 1894. Completing his internship at St. Luke's Hospital in 1896, Dr. Wood went to Vienna and Berlin for postgraduate study. After his return to this country he was associated with St. Luke's Hospital, serving at various times as pathologist, attending physician and consulting physician. He had been director of the radiotherapeutic department since 1921 and of the pathological laboratory since 1910. In 1945 in recognition of his completion of fifty years continuous service as a member of the hospital staff, his portrait was presented to the hospital. He served also as consulting pathologist to the Mountainside Hospital in Montclair, N. J. From 1896 to 1912 he was connected with Columbia University as instructor, adjunct professor and director of the department of clinical pathology. In 1912 he became professor and director of the university's Institute of Cancer Research, serving until 1940, when he became emeritus professor. From 1925 until 1932 Dr. Wood was a member of the Council on Physical Therapy of the American Medical Association and formerly chairman of its Section on Pathology and Physiology. From 1935 to 1939 he had been vice president of the International Union Against Cancer. He was an original member of the National Advisory Cancer Council appointed in 1937, a past president of the Radiological Society of North America and the American Association for Cancer Research. He was also a member of numerous national and international societies, including the American Association of Pathologists and Bacteriologists, the Society of Experimental Biology and Medicine, New York Pathological Society, of which he had been treasurer and trustee for many years, the American Cancer Society, American Society for the Control of Cancer and Association of American Physicians. He served on the advisory committee to the New York State Division on Cancer Control. When the Pan-American League Against Cancer was formed, in 1941, Dr. Wood was head of the organizing committee. He was an emeritus fellow of the College of American Pathology, honorary member of the Norwegian Society for Medical Radiology, a member of the Legion of Honor of France, and the Belgian Order of the Crown. In 1939 he was the recipient of the Clement Cleveland Medal in recognition of his work as chairman of the New York World's Fair Cancer Exhibit. He was the editor of Delafield and Prudden's "Textbook of Pathology," sixteenth edition (1935), and of the *American Journal of Cancer* from 1930 until 1941. Dr Wood was the author of "Chemical and Microscopical Diagnosis" (1905) and of many contributions to the periodical literature. His latest work an "Atlas on Tumor Pathology" will be ready for publication shortly. He received an honorary doctor of science degree from Tufts in 1925 and Ohio State University in 1931.

Heuer, George Julius, Rye, N. Y.; born in Madison, Wis., Feb. 6, 1882; Johns Hopkins University School of Medicine, Baltimore, 1907; interned at the Johns Hopkins Hospital in Baltimore, where he later was resident surgeon; associate professor of surgery at his alma mater from 1914 to 1922; professor of surgery at the University of Cincinnati College of Medicine and surgical director of Cincinnati General Hospital from 1922 to 1931; professor of surgery at Cornell University Medical College from 1931 to 1947, when he became professor emeritus; consultant surgeon at New York Hospital, where from 1931 to 1947 he was surgeon in chief; during World War I served as a major in the Medical Corps of the U. S. Army in France; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons and the American Association for the Advancement of Science; member of the American Surgical Association, Southern Surgical Association, Society of Clinical Surgery, Society of Neurological Surgeons, American Association of Thoracic Surgery, New York Surgical Society, New York Academy of Medicine, Harvey Society of New York, American Genetic Association, New York Academy of Science and the Osler Society of New York; honorary fellow of the Chicago Surgical Society; honorary member of the Society of University Surgeons; corresponding honorary member of the Academy of Science, University of Havana; on the advisory board of the Cushing Brain Tumor Registry of Yale University School of Medicine, New Haven, Conn.; in 1932 received the honorary LL.D. from the University of Cincinnati; contributed chapters on surgery of the thorax to Keen's "Surgery," Lewis' "Practice of Surgery" and "Nelson's Loose Leaf Living Surgery"; died in Fort Lauderdale, Fla., December 15, aged 68, of myocardial infarction.

Conner, Lewis Atterbury, New York; born in New Albany, Ind., Jan. 17, 1867; College of Physicians and Surgeons, medical department of Columbia College, New York, 1890; emeritus professor of clinical medicine at Cornell University Medical College; specialist certified by the American Board of Internal Medicine; in 1912 guided the organization of the experimental Trade School for Cardiac Convalescents in New York, with workshops at Sharon, Conn.; one of the founders and first president of the American Heart Association, which in 1938 established the Lewis A. Conner Lecture and in June 1950 presented him with the Gold Heart Award for his outstanding contribution in the field of cardiovascular disease; fellow and formerly vice president of the New York Academy of Medicine; fellow of the American College of Physicians; member of the American Medical Association and the Association of American Physicians, of which he had been president; from 1922 to 1930 member of the National Board of Medical Examiners; veteran of the Spanish-American War; during World War I was a colonel in the Medical Corps of the U. S. Army, received the Distinguished Service Medal and was retired with the rank of brigadier general; attending physician at the New York Hospital from 1905 to 1932, when he became consulting physician; first editor of the *American Heart Journal*, from 1925 to 1937; died in New York Hospital December 4, aged 83, of cerebral embolism.

Buffington, Wiley Ross ⊕ New Orleans; born in College Hill, Ark., Aug. 29, 1875; Medical Department of Tulane University of Louisiana, New Orleans, 1899; in 1926 appointed professor and head of the department of ophthalmology at his alma mater and served in that capacity until his resignation in 1940, when he was appointed professor emeritus; vice chairman of the Section on Ophthalmology of the American Medical Association, 1941-1942; served as president of the Louisiana-Mississippi Society of Ophthalmology and Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology, the Southern Medical Association and the Association for Research in Ophthalmology; specialist certified by the American Board of Ophthalmology; served during World War I; formerly associated with the U. S. Public Health Service; member of the attending staff of the Southern Baptist Hospital; a consultant in ophthalmology at the Charity Hospital, Marine Hospital and the Eye, Ear, Nose and Throat Hospital, where he died November 30, aged 75, of adenocarcinoma of the prostate.

Davis, Carl Braden, Winnetka, Ill.; born in Chicago Oct. 9, 1877; Rush Medical College, Chicago, 1903; served an internship and residency at Presbyterian Hospital, Chicago, from 1903 to 1905; later studied in Berlin, Munich, Paris, London and Vienna; formerly a member of the faculty of his alma mater; professor of surgery emeritus at the University of

⊕ Indicates Fellow of the American Medical Association.

Illinois College of Medicine in Chicago; member of the House of Delegates of the American Medical Association in 1923, 1924 and 1925; member of the founders group of the American Board of Surgery; member of the American Surgical Association, Chicago Surgical Society, Institute of Medicine of Chicago, Western Surgical Society and the Society of Clinical Surgery; fellow of the American College of Surgeons; member of the Presbyterian Hospital staff since 1905, when he was appointed assistant surgeon; for many years on the staff of the Cook County Hospital in Chicago and at one time on the staff of the Evanston (Ill.) Hospital; died December 11, aged 73, of brain tumor.

Morrison, Morgan T., ⊕ Sutton, W. Va.; University of Louisville (Ky.) Medical Department, 1891; for many years member of the Public Health Council; served as secretary and for two terms as president of the Central West Virginia Medical Society; for four years councilor of the West Virginia State Medical Association; formerly county health officer; for eight years postmaster at Sutton and for one term member of the state legislature; served as chairman of the Braxton County Tuberculosis Association and president of the Braxton Chapter of the National Foundation for Infantile Paralysis; died December 21, aged 82, of arteriosclerosis.

Stoloff, Isaac Arthur, New York; born Feb. 25, 1886; Long Island College Hospital, Brooklyn, 1907; fellow of the International College of Surgeons; member of the National Gastroenterological Association; past president of the New York Physicians' Medical Society, of which he had been an executive member; formerly on the faculty of New York Medical College, Flower and Fifth Avenue Hospitals and New York Polyclinic Medical School and Hospital; served on the staffs of the New City Children's Hospital, Beth David Hospital and the Hospital for Joint Diseases; died in St. Petersburg, Fla., December 18, aged 64.

Rosman, Daniel Merril ⊕ Philadelphia; born in Philadelphia Dec. 9, 1905; Hahnemann Medical College and Hospital of Philadelphia, 1932; also a graduate in pharmacy; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; served during World War II; a director of research education and mental hygiene for the Veterans Administration; on the staffs of the Graduate Hospital of the University of Pennsylvania and Philadelphia Psychiatric Hospital; died December 12, aged 45, of acute coronary occlusion.

Adams, Edward, Paducah, Ky.; Kentucky School of Medicine, Louisville, 1904; member of the American Medical Association; formerly secretary of McCracken County Medical Society; at one time city physician; died November 24, aged 76.

Alexander, Frank Stanley, Hartford, Ark. (licensed in Arkansas in 1903); died recently, aged 79.

Aplin, Floyd Walter, Waukesha, Wis.; Northwestern University Medical School, Chicago, 1904; past president of the Waukesha County Medical Society; served during World War I; for many years affiliated with Waukesha Springs Sanitarium; died November 23, aged 75, of encephalitis and carcinoma.

Aron, Benedict ⊕ Chicago; Chicago College of Medicine and Surgery, 1916; served overseas during World War I and received the Purple Heart and Silver Star; surgeon general of the Illinois National Guard, retired and advanced to brigadier general in 1947; member of the Association of Military Surgeons of the United States; on the staffs of St. Bernard's and Holy Cross hospitals; died December 8, aged 63, of coronary occlusion.

Axselrod, Edward, Port Henry, N. Y.; New York Medical College, Flower and Fifth Avenue Hospitals, New York, 1940; member of the American Medical Association; certified by the National Board of Medical Examiners; served during World War II; died in Memorial Hospital, New York, December 6, aged 35.

Bailey, Steele, Jr., ⊕ Eureka, Utah; Hospital College of Medicine, Louisville, Ky., 1905; died in Salt Lake City December 15, aged 68, of diabetes mellitus.

Berejkoff, Konstantine Ivan, San Francisco; University of Tomsk Faculty of Medicine, Russia, 1916; member of the American Medical Association; died November 4, aged 58.

Branch, William Harold, Jersey City, N. J.; Howard University College of Medicine, Washington, D. C., 1928; member of the American Heart Association; member of the staff of the cardiovascular research clinic of Mount Sinai Hospital; on the staff of the Jersey City Medical Center; died December 4, aged 52, of acute coronary occlusion.

Brown, Sampson, Medford, Mass.; Tufts College Medical School, Boston, 1928; on the courtesy staffs of Lawrence Memorial Hospital, Medford, New England Sanatorium in Melrose and Symmes Arlington Hospital, Arlington; died recently, aged 52, of coronary thrombosis.

Buchanan, Albert Edward, Fremont, Neb.; Medical College of Virginia, Richmond, 1900; member of the American Medical Association; past president of the Dodge County Medical Society; served during World War I; on the staff of Dodge County Community Hospital; died recently, aged 78, of carcinoma.

Burke, Edgar, Norfolk, Conn.; Hamburgische Universität Medizinische Fakultät, Hamburg, Germany, 1923; served with the German Army during World War I; affiliated with the Jersey City Medical Center in Jersey City; died in the Hartford (Conn.) Hospital December 7, aged 60, of coronary disease.

Burlew, Jesse Manning ⊕ Glendale, Calif.; Rush Medical College, Chicago, 1903; an Associate Fellow of the American Medical Association; fellow of the American College of Surgeons; served during World War I; died December 8, aged 76.

Castberg, Harold Tycho ⊕ Senior Surgeon, U. S. Public Health Service, Chicago; Stanford University School of Medicine, San Francisco, 1937; joined the public health service in 1938; served during World War II; in 1946 resigned as chief of the Bureau of Adult Health in California to become director of field investigations for the U. S. Public Health Service, Industrial Hygiene Division, Bethesda, Md.; stationed at the U. S. Marine Hospital, where he died December 5, aged 43, of coronary thrombosis.

Chillag, Laslo ⊕ New York; Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest, Hungary, 1914; died December 10, aged 59.

Cloudman, Harry Howard, Gorham, Maine; University of Vermont College of Medicine, Burlington, 1905; formerly practiced in Oklahoma City; served during World War II; died in Portland December 11, aged 73, of coronary disease.

Costello, Michael Edson, Penn Yan, N. Y.; Columbian University Medical Department, Washington, D. C., 1902; member of the American Medical Association; served during World War I; for many years health officer of the consolidated health district of Torrey-Dresden, Yates County, and of the town of Jerusalem; physician for the Yates County Jail; affiliated with Soldiers and Sailors Memorial Hospital; died in Clifton Springs Sanitarium in Clifton Springs, November 28, aged 81.

Cottom, Thomas Irving ⊕ Pittsburgh; Hahnemann Medical College and Hospital of Philadelphia, 1912; member of the American Psychiatric Association; served during World War I; formerly superintendent of Selinsgrove State Colony for Epileptics, Selinsgrove; affiliated with Shadyside Hospital, where he died December 5, aged 61.

Cox, Grover Steadman ⊕ Tabor City, N. S.; North Carolina Medical College, Charlotte, 1911; served as county health officer and as trustee of the Tabor City school; died in Duke Hospital, Durham, November 30, aged 66, of multiple myeloma.

Culverhouse, John Burnett, Baltimore; University of Maryland School of Medicine, Baltimore, 1914; died in Union Memorial Hospital, recently, aged 59, of acute coronary occlusion and hypertension.

De Vilbiss, Edgar Frank ⊕ Kansas City, Mo.; St. Louis University School of Medicine, 1905; an Associate Fellow of the American Medical Association; formerly owner of Grandview Sanitarium in Kansas City, Kan.; died December 10, aged 68, of coronary thrombosis.

Dewitt, Homer Sherman, Redondo Beach, Calif.; Drake University Medical Department, Des Moines, 1890; died November 6, aged 84, of coronary sclerosis.

Donovan, John Joseph, New York; University and Bellevue Hospital Medical College, New York, 1902; member of the American Medical Association; affiliated with Misericordia Hospital and St. Elizabeth's Hospital, where he died December 12, aged 71.

Douthirt, Cranford Haywood ⊕ Santa Fe, N. Mex.; University of Maryland School of Medicine, Baltimore, 1914; served during World War I; past president of the Union County Medical Society; director of the division of county health administration and state epidemiologist for the state health department; formerly health officer of Union County; died in St. Vincent's Hospital December 1, aged 64, of coronary thrombosis.

Fleming, Joe Vandiver Jr., ⊕ Elgin, Texas; University of Texas School of Medicine, Galveston, 1933; president of the Bastrop County Medical Society; president of the school board; medical superintendent and owner of Fleming Hospital; died in St. David's Hospital, Austin, December 20, aged 43, of hemorrhage and duodenal ulcers.

Fox, T. Greely, Sault Ste. Marie, Mich.; Detroit College of Medicine, 1907; died December 17, aged 80.

Gruskin, Benjamin ⊕ Atlantic City, N. J.; Chicago College of Medicine and Surgery, 1910; member of the Illinois State Medical Society; formerly on the faculty of his alma mater, Loyola University School of Medicine in Chicago and Temple University School of Medicine in Philadelphia; died in the Duke Hospital, Durham, N. C., December 5, aged 70, of cerebral hemorrhage.

Harsha, William Thomas ⊕ Chicago; Northwestern University Medical School, Chicago, 1908; fellow of the American College of Surgeons; formerly on the faculty of Loyola University School of Medicine; served as surgeon in chief, Illinois Central Hospital; died in Miami, Fla., December 15, aged 66, of coronary sclerosis.

Hays, Roy Gouverneur ⊕ Collingswood, N. J.; Columbia University College of Physicians and Surgeons, New York, 1917; affiliated with Cooper Hospital in Camden and Jefferson Hospital in Philadelphia, where he died December 1, aged 58, of carcinoma of the liver.

Hill, H. Hugh, Charleroi, Pa.; Cleveland Homeopathic Medical College, 1905; member of the American Medical Association; school and athletic physician of Charleroi public schools for many years; on the staff of the Charleroi-Monessen Hospital; died in Shadyside Hospital, Pittsburgh, December 9, aged 67, of acute coronary occlusion.

Hobson, Sarah Matilda, New Ipswich, N. H.; Boston University School of Medicine, 1890; formerly practiced in Chicago, where she was a member of the visiting staff of Women and Children's Hospital; for many years consulting physician to the Chicago Home for the Friendless; at one time editor of the *Journal of the American Institute of Homeopathy;* died December 4, aged 89, of cardiorenal vascular disease and arteriosclerosis.

Holmes, Charles Holyoke ⊕ Cambridge, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; health officer of the town of Cambridge; county coroner; on the auxiliary staff, Mary McClellan Hospital, where he died December 4, aged 76, of arteriosclerosis.

Hyland, Robert Francis ⊕ St. Louis; St. Louis University School of Medicine, 1911; fellow of the American College of Surgeons; chief surgeon of St. Louis Public Service Company; affiliated with St. John's Hospital, where he died December 14, aged 64, of uremia.

Jaeger, Julius P., Detroit; Michigan College of Medicine and Surgery, Detroit, 1903; member of the American Medical Association; served during the Spanish-American War; during World War I chairman of draft board no. 15; died December 4, aged 76.

Keigher, Roy Charles ⊕ Schenectady, N. Y.; Albany (N. Y.) Medical College, 1907; served as president of the Schenectady County Medical Society; died December 1, aged 65, of coronary thrombosis.

Lacey, Verne I., Yankton, S. D.; University of Nebraska College of Medicine, Omaha, 1927; member of the American Medical Association; formerly associated with the Indian Service; served as city health officer; on the staff of Sacred Heart Hospital, where he died November 6, aged 52, of cerebral thrombosis and cerebral arteriosclerosis.

Lane, Presley Carr, St. Louis; St. Louis Medical College, 1882; died December 10, aged 92, of cardiac failure.

Leisure, John Brannin, Watonga, Okla.; St. Louis University School of Medicine, 1906; died December 17, aged 73.

Lippman, Marion Hyman ⊕ San Francisco; University of California Medical School, San Francisco, 1925; died in Hahnemann Hospital November 17, aged 58.

Long, Edgar Hazeltine ⊕ South Vienna, Ohio; Eclectic Medical College, Cincinnati, 1920; died December 8, aged 53, of coronary thrombosis.

Love, Thomas Arnold, Ripley, Okla.; American Medical College, St. Louis, 1899; formerly on the staff of Masonic Hospital in Cushing; died November 16, aged 76, of heart disease.

Lowe, William Robert, Midville, Ga.; Atlanta College of Physicians and Surgeons, 1909; member of the American Medical Association; served as president of the Tri-County Medical Society; for many years commissioner of Burke County and member of the school board of Burke County; died November 13, aged 65, of pulmonary embolism.

Lubash, Samuel ⊕ New York; born in Hoboken, N. J., October 10, 1896; University and Bellevue Hospital Medical College, New York, 1921; formerly assistant professor of urology at New York Medical College, Flower and Fifth Avenue Hospitals; member of the American Urological Association; fellow of the American College of Surgeons; specialist certified by American Board of Urology; on the staff of Physicians Hospital in Jackson Heights and Beth Israel Hospital; died December 8, aged 54, of acute coronary occlusion.

Mathews, George S., ⊕ Providence, R. I.; University of Pennsylvania Department of Medicine, Philadelphia, 1888; for many years affiliated with Rhode Island Hospital; died December 1, aged 88, of benign prostatic hypertrophy.

Melius, Marshall J., Milac, Minn.; University of Minnesota Medical School, Minneapolis, 1950; interned at Milwaukee County Hospital; killed in an automobile accident November 22, aged 25.

Oaks, Wilbur Wilson ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1925; fellow of the American College of Surgeons; affiliated with the American Hospital for Diseases of the Stomach and the Graduate Hospital of the University of Pennsylvania, where he died December 19, aged 51.

O'Brien, William T., Mauston, Wis.; Milwaukee Medical College, 1900; on the staff of the Mauston Hospital; died November 26, aged 77, of carcinoma of the stomach.

Ross, John Gordon, Levittown, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1895; served during World War I; died in Pilgrim State Hospital, West Brentwood, November 2, aged 78, of arteriosclerosis.

Sanford, Leonard Cutler, New Haven, Conn.; Yale University School of Medicine, New Haven, 1893; affiliated with New Haven Hospital; died in Port Sewall, Fla., December 7, aged 82, of heart disease.

GOVERNMENT SERVICES

NAVY

Stop Commissioning Reserve Physicians in Priority 2.—The Navy has stopped accepting applications for commissions in the Medical Corps of the naval reserve from physicians in priority 2 as specified in Public Law 779—Eighty-First Congress, it was announced January 29. Applications for Medical Corps reserve commissions from physicians in priority 1 have been closed since early last November. However, applications already received by Offices of Naval Procurement from priority 2 physicians will continue to be processed. Medical students in the Navy's ensign probationary programs are not affected. The Navy announced also that it would continue to accept applications for the Medical Corps reserve from physicians in priorities 3 and 4. Priority 2 includes physicians and dentists who participated in the Navy's V-12 program or similar programs and those persons who were deferred from service in World War II for the purpose of continuing their education, who have had 90 days or more but less than 21 months of active duty subsequent to their completion of or release from the program or course of instruction. Applications for the regular Navy Medical Corps are still being accepted from physicians in all priorities, except former students in the Army Specialized Training Program.

Rear Admiral Pugh Sworn in as Surgeon General.—Rear Admiral Lamont Pugh (MC, USN) was sworn in by Rear Admiral George L. Russell (USN), Judge Advocate General of the Navy, as Surgeon General of the Navy and chief of the Bureau of Medicine and Surgery on January 29. The ceremony took place in the office of the Secretary of the Navy, Francis P. Matthews. Rear Admiral Pugh is the twenty-fifth chief of the Bureau of Medicine and Surgery and the twenty-first to hold the title of Surgeon General of the Navy. He is the second Virginian to be appointed to this office and the second Surgeon General to be appointed while serving as deputy and assistant chief of the Bureau. He was an enlisted man in the U. S. Marine Corps in World War I and entered the Naval Medical Corps as a lieutenant (jg) in 1923. He is a specialist certified by the American Board of Surgery.

Rear Admiral Clarence J. Brown (MC, USN) was appointed deputy and assistant chief of the Bureau of Medicine and Surgery January 29. Admiral Brown entered the Navy in 1917. He is a specialist certified by the American Board of Otolaryngology and a member of the American Academy of Ophthalmology and Otolaryngology, the American Medical Association and Nu Sigma Nu and Alpha Omega Alpha medical fraternities.

PUBLIC HEALTH SERVICE

Meeting of Advisory Health Councils.—Eight national advisory health councils to the Public Health Service will meet February 17 in Washington, D. C., for their second joint session. This year the joint session is expected to give particular attention to policies followed in the allocation of grants for research and for hospital construction as they relate to civilian defense and maintenance of a volume of basic research sufficient to meet the future scientific needs of the United States. As in the past, each council will continue to meet separately during the year to consider health problems in its particular field.

This year, three additional councils will participate in the joint session. They are the Federal Hospital Council, which advises the Public Health Service on its program for hospital construction under the Hill-Burton Hospital Survey and Construction Act, and two new advisory councils established under legislation approved in 1950, the National Advisory Arthritis and Metabolic Diseases Council and the National Advisory Neurological Diseases and Blindness Council. Other councils participating in the meeting are the National Advisory Cancer Council, National Advisory Dental Research Council, National Advisory Health Council, National Advisory Heart Council and National Advisory Mental Health Council. The joint meeting will be preceded by individual council meetings, most of which will be held at the National Institutes of Health in Bethesda.

The national advisory councils consist of nongovernmental experts in the medical sciences, public health and public affairs. They have as ex officio members representatives of the Public Health Service, the Veterans Administration and the Department of Defense. All councils were established by law to advise and consult with the Surgeon General on health problems in their respective fields. One of their important functions is to make recommendations for research grants to nonfederal institutions.

Institute of Arthritis and Metabolic Diseases.—Congress recently authorized the formation of the National Institute of Arthritis and Metabolic Diseases of the Public Health Service, which will be part of the National Institutes of Health at Bethesda. It will intensify basic research in arthritis, rheumatism and such metabolic diseases as diabetes, goiter, peptic ulcer and certain forms of anemia. The new institute assumes the research functions, facilities and personnel of the recently abolished Experimental Biology and Medicine Institute; it will also support by means of grants-in-aid research in nongovernmental organizations and encourage individual investigators to undertake research in these fields. As previously announced, Dr. Russell M. Wilder has been appointed director of the National Institute of Arthritis and Metabolic Diseases and Dr. Floyd S. Daft associate director. Dr. Wilder retired December 31 as head of the Department of Medicine of the Mayo Foundation and senior consultant in medicine at the Mayo Clinic, Rochester, Minn. He is a member of the Council on Foods and Nutrition of the American Medical Association and was chairman of the Food and Nutrition Committee of the National Research Council, which he helped organize in 1940. Dr. Daft received his Ph.D. from Yale and served on the research staffs of Yale and Harvard universities. He entered the Public Health Service in 1937, where he has been chief of the Biochemistry and Nutrition Laboratory and assistant director of the Experimental Biology and Medicine Institute of the National Institutes of Health.

Dr. Burch Assigned to Liberia.—Dr. Thomas A. Burch left February 2 for Liberia for a two year tour of duty as director of the Liberian Institute, which has its headquarters in Harbel. Dr. Elmer G. Berry, who has been acting director of the institute, will begin field investigations of schistosomiasis under a cooperative research program sponsored by the Economic Cooperation Administration and the British Colonial Office. Both public health officers were detailed to Liberia from the Laboratory of Tropical Diseases of the National Institutes of Health. Dr. Burch will be in charge of research for the Public Health Mission to Liberia. About $50,000 has been allocated for the research project by the Public Health Mission, which is under the direction of Dr. Hildrus A. Poindexter. Dr. Burch, a senior assistant surgeon, joined the Public Health Service in 1946.

Dr. Byington Assigned to Kansas City.—Dr. LeGrand Byington has been placed in charge of the Office of Midwestern Communicable Disease Center Services, Kansas City, Kan. Dr. Byington has been a commissioned officer of the Public Health Service since 1921. He conducted the first controlled experiments that showed the effectiveness of Rocky Mountain spotted fever vaccine. From 1939 to 1941 he was in charge of plague control for the entire country. He was consultant to the regional Public Health Service office in Denver in 1941-1951 and, in addition, was regional medical director there for the past three years. He is a member of the founders group of the American Board of Public Health and Preventive Medicine.

VETERANS ADMINISTRATION

Close 321 VA Offices.—The Veterans Administration announces that, because of budgetary limitations in the fiscal year 1952, it will, on April 1, 1951, close 321 VA offices, where only one contact representative is assigned. One hundred and seventeen of the offices to be closed, while each has only one contact representative, have representatives of other services. Four of the offices have as many as 25 persons on their staff. The reason for closing the offices is contained in the justification and explanation of the 1952 budget which has been submitted to Congress. Of the total of 2,544 employees, it is estimated that 550 will be assigned to hospitals.

Personal.—Dr. John G. Hood, who nas been manager of the Veterans Administration Hospital at Chamblee, Ga., has been appointed manager of the VA Hospital at Richmond, Va. Dr. Hood has been with the VA since 1930, except for three years during World War II when he served in the Army.

Mr. Charlie T. Jackson, Fort Snelling Area Medical Office administrative field representative, has been appointed manager of the 100 bed VA hospital under construction at Miles City, Mont. Mr. Jackson entered VA service in 1922, after nearly two years with the field service in the Marine Hospitals of the Public Health Service.

John C. Phillips, formerly assistant manager of the Veterans Administration (Crile) Hospital in Cleveland, has been appointed manager of the hospital. Prior to World War II service, Mr. Phillips was hospital administrator in private industry.

MISCELLANEOUS

Radioisotope Service at Brookhaven Laboratory.—The U. S. Atomic Energy Commission has authorized the Brookhaven National Laboratory to make available for distribution certain radioisotopes produced in its new nuclear reactor. Brookhaven will supply radioisotopes with very short half-lives or of higher specific activity (radiation emitted per unit mass) than could be produced in the Oak Ridge National Laboratory reactor. The higher neutron flux (number of neutrons per square centimeter per second) of the special irradiation equipment built into the Brookhaven reactor will allow, also, the production of more potent radioisotopes than could be made in the Oak Ridge reactor. The Oak Ridge reactor will continue to be the nation's principal radioisotopes source.

Requests for radioisotopes must still be made directly to the Isotopes Division, U. S. Atomic Energy Commission, Oak Ridge, Tenn. Service irradiation will not be performed at Brookhaven unless authorized by the Isotopes Division. Brookhaven production will be principally concerned with requests for highly radioactive isotopes, isotopes with half-lives too short for distance shipment or when geographic location or unusual delivery schedules warrant special consideration.

The Brookhaven reactor, which began operation in August 1950, accommodates a larger number of simultaneous experiments than are possible with any other known reactor. Pneumatic tubes can whisk samples into the reactor and deliver resultant radioisotopes to adjacent laboratories within a few seconds. A conveyor chain of 300 aluminum containers can move samples to be irradiated into the reactor to specified locations where the desired neutron concentration is available. The chain can discharge samples at any time, without disrupting operation of the reactor. Brookhaven National Laboratory is the northeastern center for nuclear research and development operated by Associated Universities, Inc., under contract with the commission.

In a reactor, a radioisotope is made when a neutron strikes and is absorbed by the nucleus of an atom. The addition of a neutron will cause many nuclei to become radioactive and cause them to give off rays or particles. As this radiation can be detected by Geiger counters, radioisotopes are versatile "tracers." Even in harmless amounts they can serve as invisible "walkie talkies" signaling their presence back to a counter. From the blood stream of a patient, radioisotopes can supply a doctor with information on absorption by the body of various minerals. As a sample of typical radioisotope research at Brookhaven itself, medical specialists expect to learn more about new methods of diagnosis and treatment of various diseases in the laboratory's research hospital.

SECRETARY OF DEFENSE

Armed Forces Medical Policy Council

Members of the Armed Forces Medical Policy Council, which was established by the Secretary of Defense on Jan. 2, 1951, left to right: Major Gen. Harry G. Armstrong, Surgeon General, Department of the Air Force; James P. Hollers, D.D.S., San Antonio, Texas; Rear Admiral Herbert L. Pugh, Surgeon General, Department of the Navy; Richard L. Meiling, M.D., chairman; Major Gen. Raymond W. Bliss, Surgeon General, Department of the Army; I. S. Ravdin, M.D., Philadelphia, and W. Randolph Lovelace II, M.D., Albuquerque, N. Mex.

FOREIGN LETTERS

LONDON

Influenza.—A large part of Europe is undergoing its second extensive epidemic of influenza in the past two years and Great Britain its first in seven years. News of the present outbreak came from Sweden last August; the epidemic was reported as due to virus A'. This is an antigenic variant of virus A, which was first recognized in the United States of America and in Europe in 1947 but in certain respects is different from previously isolated A strains, such as PR8. In November, after a short interval, the disease reappeared in Sweden; it rapidly spread to Norway and Denmark. It next made its appearance in Great Britain in Tyneside during the last week of the old year, and shortly afterward in Northern Ireland and in Merseyside. Since then it has been reported from Northern Spain, Northern France, Belgium and the low countries.

There has been little influenza due to virus A in Britain since 1943, except for small outbreaks in 1947 and 1949. In the latter year the extensive European epidemic started in Sardinia in 1948 and spread to Iceland but left Scandinavia and Britain almost unaffected. The current incidence of influenza has reached epidemic proportions in the northern and northeastern regions of England. However, there is an increasing incidence in the southern regions.

TABLE 1.—*Pneumonia and Influenza Deaths (by Weeks)*

	Dec. 2	Dec. 9	Dec. 16	Dec. 23	Dec. 30	Jan. 6	Jan. 13	Jan. 20
Pneumonia								
No. cases	282	317	374	391	502	956	1,300	.....
Deaths	198	226	280	251	383	770	982	.....
Influenza deaths	28	34	33	54	102	458	890	1,099

TABLE 2.—*Pneumonia and Influenza Deaths in 1949, 1950 and 1951*

	1949	1950	1951
Pneumonia			
No. cases	1,237	1,189	2,256
Deaths	799	599	1,752
Influenza deaths	87	90	1,348

TABLE 3.—*Influenza Deaths per Million Population, by Regions*

	Week Ending Jan. 6	Week Ending Jan. 13
Northern	63	91
Northwestern	63	138
London and S. E.	11	21
Remaining regions (average)	5	13

In the large towns of England and Wales, deaths from influenza increased from 458 in the week ended January 6 to 890 in the week ended January 13 to 1,099 in the week ended January 20. According to the *Lancet* this is the largest increment in the past 20 years. The figures relating to pneumonia cases and deaths and to influenza deaths in the large towns during the eight weeks up to January 13 are shown in table 1.

The figures for the large towns during the first two weeks of this year compared with the corresponding period for the preceding two years are shown in table 2.

For the whole of England and Wales the number of cases of primary and influenzal pneumonia notified in the seven weeks up to January 13 were 497, 573, 684, 647, 962, 1,774 and 2,538.

The *British Medical Journal* of January 27 notes that 85 per cent of influenzal deaths occur in the older age groups, i. e., over 55 years, and that the increase of the pneumonia deaths in the large towns is proportionately much less than that of influenza deaths. The journal notes also the large numbers of deaths from pneumonia and influenza in the large towns in the more northerly parts of the country, especially Liverpool. Of 949 deaths in that city during the week ending January 13, 216 were attributed to influenza and 214 to pneumonia. The *Times* of January 17 reported that Prof. W. M. Fraser, the medical officer of health, said that an average weekly figure for deaths in this city at this time of year is 200.

Under the National Insurance Act new claims to sickness benefit numbered 233,400 for the week ended January 2, 412,000 for the week ended January 9 and 426,900 for the week ended January 16.

The *Lancet*, in a leading article January 27, made the following observations: Even in the over 55 age group the majority of fatal cases are largely confined to persons already suffering from cardiac and other chronic illnesses. Influenza virus A is apt to cause more widespread trouble than virus B. Since 1947 the old A strains have been replaced all over the world by a serologic variant called A', first detected in Australia in 1946. This virus caused outbreaks in the United States and smaller ones in Britain and Sweden in 1947. Since Britain and Scandinavia suffered less than the rest of Europe in 1949, they may be expected to be more seriously affected this time. It would be interesting to see whether the United States becomes involved; since there was a good deal of influenza in the United States last year, when England had very little, herd-immunity in the former may still be in effect.

The *Lancet* summarized current opinion on virus vaccines as follows: If a formalized vaccine against the prevailing type of virus is available, it will give some, but not total, protection. With the better facilities for studying this disease, owing to the efforts of the World Health Organization World Influenza Center in London, we should in future years know what type to expect. The problem therefore becomes economic, because a monovalent vaccine is likely to be better than a polyvalent one. This would mean that manufacturers would have to keep large stocks of vaccines against all the main types, for use when an epidemic threatens. Big stocks might therefore be wasted, for types may keep changing. The *Lancet* questions the value of amassing huge stocks of vaccine for temporary protection against a relatively mild and still unpredictable disease. The journal also calls attention to the work of Professor Burnet of Melbourne, who used the influenza virus in an attempt to unravel the tangle in the relation between viruses and cells. His work suggests gene recombination or hybridization between two influenza viruses with different properties. The *Lancet* also calls attention to the stimulating but still unorthodox views of Dr. L. Hoyle (*J. Hyg.* **48**:277, 1950) on the life cycle of the influenza virus.

ITALY

National Congresses of Medicine and Surgery.—The congresses of the two national societies of medicine and surgery met at Montecatini (Tuskany), from October 9 to 15, and were attended by more than 3,000 physicians. These congresses take place every year and correspond to the Annual Clinical Session of the American Medical Association. The Congress of Medicine met exactly on the fifty-first anniversary of the founding of the society and was presided over by Professor Frugoni, chairman of the medical clinic of the University of Rome.

The medical subjects discussed were dystrophy of diencephalohypophysial origin and essential hypertension. In surgery, the subjects were cancer of the rectum and surgical and hormonal cure of cryptorchism. Cancer of the lungs was discussed in a combined session.

DIENCEPHALOHYPOPHYSIAL DYSTROPHY

The report on diencephalohypophysial dystrophy was prepared by the late Professor Gamna, formerly director of the medical clinic of Turin, and presented by his assistant, Professor Ceresa. The report reviewed all the syndromes of

The items in these letters are contributed by regular correspondents in the various foreign countries.

definitely organic origin, such as hypopituitary cachexia (Simmonds' disease), adiposogenital dystrophy (Fröhlich's syndrome), infantilism, pituitary dwarfism, acromegaly and gigantism. The report also surveyed the syndromes that do not show a true and readily accessible lesion, such as juvenile hypophysial cachexia, maldevelopment of delayed female puberty (Kylin), grave hypophysial asthenia (Wahlberg), endocrine deficiency (Shellong), hypophysial cachexia (Meyler) and anorexia nervosa.

Emphasis will be placed here on Ceresa's evaluation of hypophysial function through the determination of 17-ketosteroids, estrus-producing compounds and 11-oxycorticosteroid-like compounds in the urine. Butenandt in 1931 isolated from urine of males a crystalline steroid, identified in 1934 as androsterone, the first of the class of substances known as 17-ketosteroids. Determination of the urinary 17-ketosteroids assumes significance, because it is now known that they are products of the adrenal cortex in women and of the adrenal cortex and testes in men (Mason and Engstrom: The 17-Ketosteroids: Their Origin, Determination and Significance, *Physiol. Rev.* **30**:321 [July] 1950). Ceresa reported on a technic for the evaluation of hypopituitarism, developed by himself and Dr. Rubino. Patients are given injections of 500 units of hypophysial gonadotropic hormone for five consecutive days. An increase in the level of urinary 17-ketosteroids demonstrates that the dystrophy is primarily of adrenocorticopituitary origin and that the hypogenitalism of the clinical syndrome is due to anterior pituitary insufficiency. On the other hand, if the excretion of 17-ketosteroids remains unchanged, Ceresa concludes that the hypogenitalism is not caused by hypopituitarism, and that, if the patient is a male, it may be attributed largely to a functional disturbance of the testes. This permits adjustment of the therapeutic management.

ESSENTIAL HYPERTENSION

This subject was presented by Professors G. Melli and C. Bartorelli of the Institute of Medical Clinics of the University of Milan; by Professor Cattaneo, an ophthalmologist, and by Prof. Piero Frugoni, surgeon of the University of Rome. The speakers wished to limit the term "essential" hypertension to a syndrome characterized by an increase in both systolic and diastolic blood pressures, not related to renal or arteriosclerotic diseases nor to any known cause attributable to arterial spasm. They proposed to the assembly that the disease should be called "essential hypertension, or Forlanini's syndrome," since Carlo Forlanini, who introduced pneumothorax in pulmonary tuberculosis, described it with great precision for the first time under the name of solitary hypertension. The various causes of hypertension were reviewed, from hyperthyroidism and changes of the aorta (e. g., coarctation), to those of psychic and adrenal origin. Selye's concept of the cause of stress was repeatedly discussed. Criticism was expressed concerning the "adaptation" which Selye was compelled to add to his own theory, after observing the therapeutic effects of cortisone and pituitary adrenocorticotropic hormone. Since the evaluation of the mechanism of sympathetic stimulation of the adrenal medulla, with liberation of epinephrine as the initial response caused by stress, was omitted from this otherwise excellent report, the results that today are being obtained—especially in England—with the antihypertensive quaternary ammonium compounds were not brought forward. These drugs decrease the blood pressure, because they interfere with the pathway of "stress" along the sympathetic system. They have analogous actions in other internal disorders associated with the autonomic nervous system, such as peptic ulcer. The important paper on this subject by K. S. Grimson, C. K. Lyons and R. J. Reeves (*J. A. M. A.* **143**:873 [July 8] 1950) has been widely commented on in Italy. The speakers showed some skepticism concerning sodium-free diet in hypertension, pointing out that the severe diet imposed by Kempner frequently causes more damage than benefit. Selye pointed out in his chapter on hypertension that the sodium-free diet should certainly not be used in all types of hypertension but should be limited to that arising from renal lesions, which as a rule has a malignant character and in which the sodium-free diet gives gratifying results. Piero Frugoni advocated surgical intervention in hypertension.

CANCER OF THE LUNG

Prof. A. Dalla Volta, of the University of Modena, discussed cancer of the lung from a medical viewpoint, Prof. A. Businco, of the University of Bologna, discussed the pathological anatomy, Prof. G. G. Palmieri, of the University of Bologna, the roentgenologic aspect and Prof. P. Valdoni, director of the Institute of Surgical Pathology of the University of Rome, the surgical aspect.

The incidence of cancer of the lung is increasing in Italy. Professor Valdoni spoke of his observations on 235 patients with this disease observed in three years at the Institute of Pathology of Rome. Ninety per cent of the patients were males, whose age on the average was 48. Pneumonectomy was performed in 90 cases. In 33 per cent of the cases, the cancer originated in the large and medium-sized bronchi, and in 18.7 per cent cancer originated in the small bronchi. The presence of squamous metaplasia was demonstrated. In 68.7 per cent, the cancer was on the right side, in 61 per cent it was in the upper lobe. There were only two cases of malignant tumors of the connective tissue. Valdoni pointed out the histological similarity with epizootic adenomatosis. It is interesting to note that Dr. Evarts A. Graham published in October 1950 his study on "The Problem of Bronchiogenic Carcinoma" (*S. Clin. North America* **30**:1259 [Oct.] 1950) stressing the clinical and microscopic resemblance of alveolar carcinoma in man with this disease of sheep, known also as "jagziekte." This disease is common in South Africa, Iceland and the western part of the United States and is thought to be of virus origin. This is of interest, since many pathologists believe that cancer of the lungs may also be due to a filtrable virus. As Graham declares, "If this newly discovered primary cancer of the lung in the human is actually the same as the 'jagziekte' of sheep it will probably increase in frequency and probably also it will be found subsequently to represent a virus infection."

Valdoni called attention to the possibility that the increased incidence of cancer of the lung in the age group of 45 to 50 years might be related to the influenza virus of the 1918 epidemic. This virus perhaps remains in an intracellular stage for decades and by accidental stimulation (such as tobacco) may become reactivated and in the face of declining hormonal equilibrium, may give rise to cancer. Valdoni appeared to be somewhat skeptical of the relation between cigaret smoking and cancer. The lymphatic propagation of bronchial carcinoma is of significance. Metastatic lymph nodes on the right compress the superior vena cava. On the left side, metastatic nodes compress the recurrent laryngeal nerve, producing paralysis of the vocal cords. According to Valdoni, compression of the superior vena cava and of the recurrent nerve are signs of spread of the disease beyond operable limits. The speaker remarked that only 10 per cent of the patients referred by the general practitioner are operable. Diagnosis is delayed owing to the ambiguity of the clinical symptoms. On the other hand, according to Graham in the article mentioned above, in the United States, where diagnostic procedures are certainly more adequate than in Italy, only 22.3 per cent of the patients sent to the surgeon are operable. Valdoni listed the more accurate means of establishing the diagnosis: roentgenography in frontal and lateral projections, tomography, bronchoscopy, examination of the sputum for neoplastic cells and exploratory thoracotomy, an operation that does not present any greater difficulty than an exploratory laparotomy.

Valdoni, however, did not stress in his report the "silent phase" admirably discussed by Drs. Richard H. Overholt and Ivan C. Schmidt (*J. A. M. A.* **141**:817 [Nov. 19] 1949). For the discovery of this phase, Overholt not only employed exploratory thoracotomy but also excised a piece of the lung for microscopic examination and proceeded to the removal of the diseased lung, if necessary. Overholt's technic has been practiced frequently in Italy. Valdoni stated that the opera-

tive mortality has decreased in Italy from 50 per cent in 1940 to 33 per cent. However, in young persons, it has decreased to 10 and even to 5 per cent. During the first three months following pneumonectomy, death may result either from cardiovascular disturbances or from metastases. A five year survival period has been observed in 13.7 per cent of those operated on. One patient continues to practice his favorite sport of hunting despite the extirpation of an entire lung.

Forensic Hematology.—An important National Convention on Forensic Hematology, initiated by the Italian Society of Legal Medicine and organized by Prof. Folco Domenici, was held at Viareggio, with many Italian specialists participating. Dr. Fornari, of the Institute of Legal Medicine and Center for Hemodiagnosis of the University of Pisa, showed how the medicolegal aspects of transfusion have undergone quick modifications with progress in technic and organization. The permissibility of blood transfusion is still a subject of controversy. Recently, Professor Cattabeni, referring to the Italian penal code, considered that the donor's consent to donate his own blood is "juridically unimportant." The fact that this consent is not obtained does not render the withdrawal of blood for transfusion either lawful or illicit. Consent is necessary, however, when the surgeon performs the transfusion for a beneficial purpose but in the absence of extreme necessity. According to the speaker, a transfusion having a strictly therapeutic aim may be performed only with the aid of voluntary and suitable donors: voluntary, because removal of the blood requires the active participation of the donor; suitable, because consent alone does not eliminate responsibility for damages caused by clinically predictable contraindications.

The problem of the donor's right to compensation was legally solved long ago, voluntary donation of blood as well as the compensation for it being perfectly legal. With respect to the responsibility of the physician performing the transfusion, there exists in Italy a precise juridical rule. In principle, cases that might imply a professional responsibility include transfusion performed despite clinical contraindications, failure to do so when an absolute indication exists, erroneous selection of blood for transfusion and error in technic. Contraindications are rare and are concerned especially with cardiac defects, such as severe myocarditis. A physician may be considered guilty of malpractice only when he is proved to have neglected to administer the transfusion although he had the opportunity of doing it, and when there was indisputable indication, which is, according to Lattes, an acute hemorrhage with significant decrease of blood volume.

Of primary importance with regard to the physician's responsibility is the selection of blood for transfusion. Selection should be based on the important rule of Ottemberg that the recipient's blood should not contain any antibody that may act on the donor's red blood cells. It is not permissible to proceed with a transfusion—even if urgently needed—without prior serologic examination. In well equipped centers the patient's blood type must be determined not only according to ABO grouping system but also with regard to the MNP and Rh group factors. Referring to diseases transmitted by transfusion, the speaker stressed malaria, especially the quartan form, and epidemic hepatitis.

PROGRESS IN BLOOD IDENTIFICATION

Professor Formaggio, of the Medico-Legal Institute of the University of Pavia, discussed progress in forensic hematology. Efforts of investigators during the last years have been directed toward obtaining of easily induced reactions that could be considered as reliable tests for recognition of blood and as preliminary tests for other medicolegal research.

In Italy, the contributions of Professor Palmieri's school, particularly Guarino's research, deserve mention. Guarino proposed a new chromatic reaction using dimethylphenylamine and introduced a method using iodoform and trinitrophenol (picric acid), which yields abundant crystals of hematoporphyrin. Dr. Ungaro introduced a modification to Ferreira's reagent, with which stable crystallization of hemochromogen can be obtained. According to Formaggio, spectroscopic investigation still constitutes the only test definitely identifying blood.

Professor Uhlenhuth recently expressed the opinion that at present the anaphylactic tests provide the greatest specificity in the diagnosis of blood conditions. Complement deviation cannot be used in medicolegal procedures, since recent researches have shown that its excessive sensitivity may produce positive results because of impurities. Besides the biologic procedures for specific diagnosis of blood, Professor Del Carpio has recently studied the possibilities of spectrography.

The technic for determination of blood groups and occasionally of blood subgroups, either with fresh blood or with blood stored for short periods, is of great importance. The diagnosis may be obtained by determination of either the agglutinins in the desiccated blood or of the agglutinogens by adsorption tests. Identification of extragroup hemoantigens still remains limited to experimental investigations. Recent advances concerning group O and the elimination of group-specific activity should be kept in mind, since they may soon be adaptable for practical application.

THE GROUP-SPECIFIC SYSTEMS

Prof. Francesco Tarsitano, of the Institute of Legal Medicine of Naples, discussed knowledge acquired in the last five years regarding the group-specific systems, which are more directly concerned with the biologic investigation of paternity. He emphasized their importance in the solution of this problem. The importance of the subgroups A_1 and A_2 in this matter has been confirmed in the ABO system. In the study of A_2B, Moureau affirmed that each of the various subgroups is inherited individually, according to the mendelian law. Two types of antigen O have been differentiated. In the MNS system, the existence of natural anti-M and anti-N agglutinins and of isosensitization has been confirmed. In the P system, the existence of natural anti-P agglutinins and of transfusion sensitization has been confirmed. Other systems studied were Lu^A-Lu^B, Leway's and Jobbins' systems. These studies open up enticing theoretical vistas, but at present their practical application for medicolegal purposes is rather limited. Need arises for continuation of this important research and for improvement in its organization.

SWEDEN

Prognosis for Infarct of the Heart.—In *Svenska Läkartidningen* for Dec. 1, 1950, Dr. Gunnar Waallgren published an intensive study of 170 cases of infarct of the heart (some of them treated more than once in the same year, the actual number of patients being therefore only 163) treated at the Schlgrenska Hospital in Gothenburg in 1948. The diagnosis was confirmed in almost every case by typical electrocardiographic changes or by postmortem observations. The cases were classified in three groups according to the severity of the disease. There were only six cases in the "best" group, characterized only by typical electrocardiographic changes and not presenting fever, increased sedimentation rates or leukocytosis. Most of the cases belonged to the intermediate group, 115 in all. There were almost twice as many men as women, but the fatality rate was the same for both sexes. Among the 51 hospital deaths there were as many as 10 that occurred within the first 24 hours; altogether there were 30 deaths in the first week. The 112 patients who survived hospital treatment were followed up with the exception of five, who could not be traced. Among the remaining 107 there were 75 who were still alive on Oct. 1, 1950. As for the 32 who had died in the interval, four had died of causes other than infarct of the heart.

Dr. Waallgren has made another instructive calculation, which shows the approximate risk of fatal infarct of the heart in a given population. During 1948 there were 2,803 deaths in Gothenburg, whose population is nearly 344,000. In 1,983 of these cases, a postmortem examination was made (70.7 per cent). The postmortem records were studied in 1,765 of these

cases; among them there were 135 in which the cause of death was shown to be infarct of the heart. In other words, 7.65 per cent of the postmortem examinations revealed fatal infarct of the heart. This is remarkably confirmatory of the conclusion to which McCain and his colleagues in the United States came after a study of 3,559 postmortem examinations, among which myocardial infarct was recorded in 281 cases, or 7.8 per cent. Dr. Waallgren calculates that, if the more or less immediate mortality from infarct of the heart is about 30 per cent, then 713 persons are overtaken by infarct of the heart every year in Gothenburg, an average of two cases per day.

Road Accidents.—At meetings of the Swedish Medical Society in 1946 and again in 1950, discussions took place on the subject of road accidents. Evidently the problem is much the same whether it concerns Sweden or some other country with a well developed system of roads, but this does not necessarily mean that it can be left to other countries for solution. As was recently pointed out by Dr. E. Rietz of Stockholm, accidents are the most important cause of death between the ages of 1 and 5 years and second only to tuberculosis between the ages of 5 and 30. It ranks third between the ages of 30 and 40 and fourth between the ages of 40 and 50. Since 1944 the number of deaths on the road in Stockholm has been trebled.

At the meeting of the Swedish Medical Society in 1950, Georg Hedström gave an account of a study he had undertaken on behalf of a traffic insurance company with respect to road accidents in 1947, when some 6,200 persons were injured in 42,300 accidents leading to the death of 321 persons. The figure 42,300 refers to the number of persons insured against accidents on the road and involved in them. It was found that about 90 per cent of the causes of the accidents could be traced to the human factor and only 10 per cent to faults in the road and vehicles. When the accidents were classified according to the day of the week on which they had occurred, Saturday was highest, with 18.3 per cent, and Sunday lowest, with 11.8 per cent. The accident rate was highest in the afternoon, between 4 and 6 o'clock. Only 3 per cent of the motor drivers examined were found to have been under the influence of alcohol. The number of persons killed in proportion to the total number of persons injured was highest in childhood (up to 10 years) and again in old age.

DENMARK

State Support for the Tuberculous.—When, on April 12, 1949, legislative provision was made for financing persons with or threatened by tuberculosis, the Danish government made it clear that the campaign against this disease is a matter for the community as a whole rather than for the individual sufferer. In this new law precautions are taken to prevent abuses by persons acting in opposition to specialists attached to the various tuberculosis dispensaries and sanatoriums. On the recommendations of these specialists, and on the assumption that the disease in any given case is curable, the patient is allotted funds calculated to enable him to maintain his previous standard of living. It is calculated that a married man with one child will receive between 5,000 and 6,000 kroner a year for a period up to two or three years. One of the aims of this legislation is to reassure patients who have hitherto dreaded submitting to medical examination for tuberculosis. The patient may also be helped to secure more healthful housing conditions for up to a period of five years; should his disease flare up after he had been fully fit for work, he is again eligible for state aid for two to three years. The ruling that the patient's standard of living before he fell ill is to be the measure of the help given him by the state during his illness may embarrass those persons whose original standard of living had from force of circumstances been low, and provision is made for avoidance of unnecessary hardships in such cases. The patient with incurable, chronic disease is provided for by earlier legislation.

To qualify for the receipt of state aid under the new law, the patient must produce evidence from the medical authorities that there is a prospect of his being cured within two or three years. In theory, at any rate, the doctor who considers his patient incurable is not justified in supporting his claim to state aid. The same doctor may find himself in a quandary when he would like to certify that his patient is qualified for state aid while he has also to admit to an insurance society that his patient is a bad risk, with little chance of complete recovery. Fortunately the Ministry of Social Affairs is aware of this problem and allows specialists in tuberculosis considerable latitude in their decisions about individual cases. In their interpretation of the spirit as well as of the letter of the new law, tuberculosis specialists may invoke its aid also in those cases in which pulmonary tuberculosis has not actually developed but is likely to do so because of a history of pleurisy or some other early manifestation of tuberculous infection. The main aim of the new law is to try to make sure that no tuberculous patient in Denmark has a recurrence of his disease on account of his poverty.

Child Psychiatry in Denmark.—The first psychiatric clinic for children was established in 1935 at the University Hospital (the Rigshospital) in Copenhagen. The experience gained at this clinic soon showed that there was a very real need for psychiatric guidance in childhood. In 1944, despite the occupation of Denmark by the Germans, a psychiatric ward for children was provided in connection with the child psychiatric clinic at the Rigshospital. This ward has 20 beds for inpatients as well as facilities for daily treatment of about 12 children who spend from a few hours to a whole day under observation or in treatment. In 1947, the municipal authorities of Copenhagen established another such ward, this time at the Bispebjerg Hospital in Copenhagen, in connection with a child psychiatric clinic created in 1946. This ward also has 20 beds for inpatients and facilities for the observation and treatment of outpatients. The children in these wards are examined for organic as well as for psychiatric ailments, and a liaison is maintained between these wards and other special hospital departments.

The three small centers in the country for children with severe behavior problems are supervised by consultant psychiatrists and are somewhat hampered by their rural isolation. The handicap of distance from urban centers deprives these rural centers of some of the benefits of appropriate psychotherapeutic measures. It may be noted that there are only a few psychiatrists in private practice in Denmark, though there is a private child psychological clinic in Copenhagen.

In 1935 the school authorities in Copenhagen created a school psychological bureau, which has grown into an important institution with 14 full time psychologists and two psychiatrists. This bureau was at first chiefly concerned with diagnosis with a view to the proper placement of children in the schools, but it has gradually become more active as a teaching and therapeutic institution. Children who are mentally backward or who suffer from defects of sight, hearing or speech are put into special classes. There are also special classes for reading-retarded children and observation classes for problem children. The school psychologists are in constant touch with the children from these classes and control the observation and treatment of them in two camps in the country where, 20 to 30 at a time, the children can be observed away from their home environment for several months. In Aarhus a child psychiatric clinic is attached to the local mental hospital.

Child psychiatry is in the main under public rather than private direction. Despite economic difficulties and, still more, the lack of fully trained psychiatrists, psychologists and social workers, Denmark is planning the establishment of child psychiatric clinics in all the larger towns in connection with their central hospitals.

CORRESPONDENCE

THE HIROSHIMA MEDICAL ASSOCIATION

To the Editor:—On this the fifth anniversary of the tragedy of Hiroshima, we regard as our greatest pleasure an opportunity to send a message to American medical men. We are impressed with and admire greatly American achievements in medicine and wish to express our profound thanks for constant enlightenment.

Despite a loss of 60 doctors among 250 members of the Hiroshima City Medical Association in that tragedy and of the loss of all the clinics and the equipment belonging to most of the members, we who survived have overcome all the unfavorable conditions and have rebuilt and reequipped our clinics and are contributing our humble efforts to the preservation of health and sanitation of the citizens. Through that tragedy, we, as medical men, have come to realize, perhaps more than any others, how precious peace and culture are for the welfare of mankind, and we solemnly swear to devote ourselves as men of science to the cause of peace and culture.

With the cooperation and financial support of doctors throughout the prefecture of Hiroshima, we have commenced a reconstruction project of the Hiroshima Medical Association Hall, which was destroyed by the atomic bomb. The new hall will be erected at the center of Hiroshima, facing the main wide avenue, along with the "Peace City" construction plan of the Hiroshima municipality. It will be the center of our medical and sanitary research projects and, at the same time, contain offices for the Hiroshima Prefecture and City Medical Associations. Its auditorium will be open to the public for general cultural activities.

As previously stated, we medical men are steadily discharging our important responsibility to the cause of peace and culture, and the warm help and protection of the United States of America has made this possible in large part. We have been profoundly impressed and wish to express our heart-felt appreciation, with our request for your constant and further guidance.

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HAEMATIN

To the Editor:—The antibiotic from red blood cells reported by Whitney, Anigstein and Micks (*Proc. Soc. Exper. Biol. & Med.* **74**:346, 1950) and commented on in THE JOURNAL, Dec. 2, 1950, almost certainly is haematin. In 1948 I found that a tryptic digest of red cells was inhibitory to a number of bacilli. The antibacterial substance was identified as haematin, and it was shown that a concentration of 1:1,000,000 would prevent an inoculum of Bacillus subtilis from growing. Most, but not all, aerobic sporing bacilli are completely inhibited by haematin at 1:20,000, but very few other organisms. I did not test antibacterial activity at concentrations higher than 1:20,000. In a preliminary note (*Nature* **162**:114, 1948) I reported that several bacilli, including Bacillus anthracis, were not inhibited by 1:20,000 haematin, but I have since found that this applies only when haematin is autoclaved in complex mediums. Under these conditions its antibacterial activity is considerably diminished, but not when it is autoclaved in synthetic mediums.

The bacilli vary in their capacity to be inhibited by blood; some are inhibited by whole blood, some by laked red cells, some by laked cells plus trypsin and some only when the haematin is completely liberated. Deuterohaematin is about as active as haematin, but mesohaematin is more active. Haematohaematin, urohaematin and the porphyrins (at 1:20,000) appear to be inactive. Further details of this work will be published (*J. Gen. Microbiol.*). In 1914 Kämmerer (*Verhandl. d. deutschen Kong. f. inn. Med.* **31**:704, 1914) reported that mesohaematin inhibited the growth of a number of gram-positive organisms but that haematin was stimulatory. It is possible that he had destroyed the antibacterial activity of haematin by autoclaving it in a complex medium.

The "clear dark brown tryptic digests" of blood and haemoglobin, which are thought by Whitney and his associates to contain an antibacterial peptide-amino acid complex, would certainly contain haematin. Like their antibiotic this substance would be active mainly against the aerobic sporing bacilli; it would resist exposure to 120 C. for 15 minutes at p_H 7.8-9.0, and it would be precipitated at p_H 5.5 or lower.

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POLIOMYELITIS AND PROPHYLACTIC IMMUNIZATION

To the Editor:—An editorial entitled "Poliomyelitis and Prophylactic Immunization" in the September 16 issue of THE JOURNAL reviews evidence that immunization against diphtheria and pertussis during an epidemic of poliomyelitis may involve the risk of activating poliomyelitis, with localization of paralysis most frequently in the inoculated limb. In the same issue (page 259) Dr. James P. Leake discusses data bearing on the problem and refers to the possible influence of overactivity as well as tonsillectomy in lowering resistance to invasion of poliomyelitis. The editorial conclusion is that immunizations might better be postponed during an epidemic of poliomyelitis whenever diphtheria and pertussis are not unduly prevalent.

Although this recommendation may later be justified, at present there is reason to consider its implication with emphasis on related facts of practical bearing, particularly in the first year. Reduction in the incidence and mortality of whooping cough and diphtheria in the past two decades is undoubtedly due principally to the increasing practice of active immunization in this early age period. Inoculation against pertussis has recently been found effective in the early weeks of life, and diphtheria immunization has been advocated earlier than formerly, with assurance of no important loss in effectiveness when the two toxoids are combined and administered before the age of 6 months with provision for later "booster" doses.

Cogent reasons for early immunization are (1) the possibility of development of pertussis in the newborn, (2) its mortality as high as 50 per cent in the first three months, (3) lack of natural immunity to diphtheria after 6 months, (4) requirement of two to four months for immunity to develop after inoculation and (5) the fact that effective combinations facilitate protection against diphtheria, pertussis and tetanus simultaneously.

Because whooping cough is perennial, with considerable frequency in summer, while diphtheria reaches its peak in November and poliomyelitis epidemics commonly occur in July, August and September, deferment of immunizations customary in infancy would seem to entail much greater responsibility than postponement of nonurgent tonsillectomy.

At present, only about one fourth of poliomyelitis cases occur before the age of 5 years, the highest incidence is at 2 years, comparatively few cases occur under 1 year and very few under 5 months. In severe epidemics, moreover, not more than one recognized case is said to occur per 1,000 population.

Taking into account the great hazard from unprevented pertussis in infancy, the persisting prevalence also, of diphtheria in underimmunized communities, the time required for dependable immunity to develop after active immunization and the demoralizing effect of a possible natural interpretation by the public that inoculations and surgery in general may predispose to poliomyelitis, there would seem to be no justification for slowing down routine immunizations in infancy, even if exceptionally it may seem permissible to temporize for reasons suggested in THE JOURNAL'S editorial in the case of older children who may have been unprotected.

This advice to get the baby protected against whooping cough and diphtheria on time need be qualified only when it is actually proved that the current practice of routine immunization in infancy entails greater danger than postponement.

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PSYCHIATRY AND UROLOGICAL PROBLEMS

To the Editor:—As a psychiatrist I find it necessary to take issue with various statements made by Dr. Edward N. Cook (Misconceptions in Urology, *J. A. M. A.* 144:1421 [Dec. 23] 1950) concerning functional sexual disturbances and enuresis. Under the heading "Conditions Based on Neuroses," the author confines causes of sexual disturbances to factors such as "fatigue, mental or physical . . . worry . . . apprehensive of the future . . . may be afflicted with mother-in-law trouble." Actually, however, none of these comprise a neurosis. A neurosis (or more accurately, psychoneurosis) is ordinarily considered to be based on a conflict between unconscious and conscious psychic elements to a degree where symptoms of one type or another are manifested.

While Dr. Cook acknowledges that sometimes it may seem wiser to turn the problem over to a psychiatrist, he adds that he does not agree with such a course "mainly because many of my patients have said to me, 'They tried to send me to a psychiatrist, but this trouble is not in my head; it is in my sexual organs.'" It would appear to me that Dr. Cook was in an excellent position when a patient made such a remark to utilize his authoritative and prestige position to recommend trained psychiatric assistance and to persuade the patient to accept psychotherapy, just as would be done in referring another type of medical case to an analogous specialty. It would be an intolerable situation, for instance, for a patient with an uncorrected refractive error whose gastric distress or other remote symptoms may stem from the eye strain, to refuse the internist's suggestion referring the patient to an ophthalmologist, with a remark that his trouble was not in his eyes but in his stomach.

Dr. Cook is to be commended for his practice of patience, sympathy and "understanding" in these cases, but psychiatrists will attest to the fact that most cases of chronic sexual disturbances are the result of deep-seated mental conflicts and that it often requires all the skill and knowledge possessed by a competent psychiatrist to overcome the difficulty; even so, there are failures. In many instances the sexual disturbance is only a facet of a complex psychoneurosis, which may sometimes require formal psychoanalysis over a period of years.

The author is also to be complimented on his readiness to consider the functional aspects in enuresis. However, he disagrees with the generally accepted psychiatric conception, which considers enuresis to be a psychopathological problem, and feels that the "solution to the entire problem" will be obtained if one question is asked: "What kind of sleeper is this patient?" His concept of enuresis is that very deep slumber prevents "subconscious processes, which normally keep the muscles controlling urination in a state of contracture, are unable to provide the proper stimulus to continue this contracture." Treatment of enuresis, then, should consist of taking measures to lighten the depth of sleep. Dr. Cook also believes that the "conflict which the psychiatrist describes—is the result of the disease and not the cause of it." This physiological theory of enuresis would make it difficult indeed to explain why millions of nonenuretic children and adolescents who undoubtedly sleep as soundly as any enuretic child, and sleep more soundly when sedated for some reason, do not manifest even occasional enuresis.

There can be no disagreement with Dr. Cook's sentiment: "The art of medicine is far too profound and complex to be symbolized simply by the act of holding a scalpel"; and it has become almost trite in current medical thinking to mention the indivisible relation between mind and body. Yet, Dr. Cook, who despite his laudable facility to consider functional elements in disordered urological processes regrettably neglects to include any form of psychiatric orientation in his list of desirable training requirements, concludes: "A urologist must be trained in all phases of the specialty: diagnosis, instrumentation, various types of local therapy and surgery; both open and closed."

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AUTOBIOGRAPHICAL SKETCHES OF DISEASE BY PHYSICIANS

To the Editor:—I have taken over the job of finishing the book on "Autobiographical Sketches of Disease by Physicians," which was started by the late Dr. Max Pinner (THE JOURNAL June 8, 1946, page 551). Because of his many years of illness from heart disease, Dr. Pinner became interested in how much he had learned about his malady which did not appear in the usual medical textbooks. He also became fascinated by how much one learns about adaptation to a chronic illness. Dr. Pinner believed that his "education" was not unique and that many other physicians who had experienced illnesses would have as much to contribute. He accordingly began to collect autobiographical sketches from physicians with the idea of publishing a book containing approximately 50 contributions.

At the time of his death, Dr. Pinner had obtained about 20 excellent sketches. It seemed a pity that such a valuable manuscript should be discarded, and his widow appealed to me to finish the book. I have been happy to take over as associate editor, leaving Dr. Pinner's name as senior editor. I hope the book will represent a genuine contribution to the understanding of disease for physicians and medical students (and also, I believe, for nurses, psychologists and social workers). W. W. Norton and Company have agreed to publish the book.

I would welcome correspondence from physicians who would like to contribute essays to Dr. Pinner's book. The essays may be written anonymously, if the author prefers that arrangement. There is a need for essays in the following fields: malignant disease, emotional breakdown with recovery, drug addiction and partial or complete loss of vision or hearing. Most of the essays average about 3,000 words. Essays on other disabilities can still be given consideration. Correspondence should be addressed to me.

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CLASSIFICATION BY BLOOD GROUPS

To the Editor:—I should like to comment on a point apparently missed in your editorial on the use of blood groups in human classification. Probably the most satisfying point about the use of the blood groups, and similar genetic factors in the study of humans, is the fact that the effect of the mixture of races can be estimated with a high degree of accuracy, provided the samples are large enough. This cannot be done by any other means of anthropological investigation. A study of the technics involved in such an analysis emphasizes the inadvisability of attempting to classify man into a series of different races, for racial mixture has taken place through the ages and to such an extent that to talk of racial types is merely begging the question.

Racial classifications, such as those suggested by Boyd and Wiener, are useful temporary expedients but cannot, in any way, be regarded as conclusive. It is far better to study each genetic factor as distributed on Cartesian charts similar to those published by me elsewhere, and, where necessary, to combine these in the form of multidimensional models.

The use of the term "Negroid group" implies a homegeneity among these people that is far from being the case. On the basis of the blood groups alone, the African tribes differ markedly, one from another, but nevertheless hold to a definite pattern, the differences being explained, in part certainly, by the impact of other peoples, for example, the Hottentot and Bushman. Even white (European) influence is making itself apparent.

I congratulate you on your emphasis on the value of this method of study of the human race.

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PLASTIC SURGERY POSTGRADUATE COURSES

To the Editor:—In THE JOURNAL of Dec. 9, 1950, on page 1298, the American Otorhinologic Society for the Advancement for Plastic Surgery, Inc., New York, was listed as giving a course in rhinoplasty and otoplasty (for specialists) from February 12 to March 17 ($500). The board of directors of this society respectfully invites your attention to the fact that the society neither gives nor sponsors this course.

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BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACT

Malpractice: Liability of United States for Negligence of Army Surgeon.—Three cases were filed under the Tort Claims Act to recover damages from the United States for injuries sustained by members of the armed forces. After being appealed to different courts of appeal, with conflicting results, they were all appealed to, and considered in one opinion by, the Supreme Court of the United States.

In one of these cases (Jefferson v. United States, 77 F. Suppl. 706; *J. A. M. A.* **138**:612 [Oct. 23] 1948), the plaintiff, while in the Army, was required to undergo an abdominal operation. About eight months later, in the course of another operation after plaintiff was discharged, a towel thirty (30) inches long by eighteen (18) inches wide, marked "Medical Department, U. S. Army" was discovered and removed from his abdomen. The complaint alleged that it was negligently left there by the army surgeon. The district court concluded that the Tort Claims Act does not charge the United States with liability in this type of case and the court of appeals affirmed this decision. In another of the cases it was contended that Griggs met death while on active duty because of unskillful medical treatment by army surgeons. The court of appeals in this case held that a cause of action existed under the Act.

The common factor underlying the three cases which were consolidated in this opinion is that each claimant while on active duty, and not on furlough, sustained injury due to others in the armed forces. The only issue of law raised, said the Supreme Court, is whether the Tort Claims Act extends its remedy to one sustaining, "incident to the service," what under other circumstances would be an actionable wrong.

There are few guiding materials for our task of statutory construction, said the Supreme Court. No committee reports or floor debates disclose what effect the statute was designed to have on the problem before us, or that it even was in mind. Under these circumstances, no conclusion can be above challenge, but if we misinterpret the Act, at least Congress possesses a ready remedy.

The Act should be construed to fit, so far as will comport with its words, into the entire statutory system of remedies against the Government to make a workable, consistent and equitable whole. The Tort Claims Act was not an isolated and spontaneous flash of congressional generosity. It marks the culmination of a long effort to mitigate the unjust consequences of sovereign immunity from suit. Relief was often sought and sometimes granted through private bills in Congress, the number of which steadily increased as Government activity increased. The volume of these private bills, the inadequacy of congressional machinery for determination of facts, the importunities to which claimants subjected members of Congress, and the capricious results, led to a strong demand that claims for tort wrongs be submitted to adjudication. At last, in connection with the Reorganization Act, the government waived immunity and transferred the burden of examining tort claims to the courts. The primary purpose of the Act, said the Supreme Court, was to extend a remedy to those who had been without. Congress was suffering from no plague of private bills on the behalf of military and naval personnel, because a comprehensive system of relief had been authorized for them and their dependents by statute.

Looking to the detail of the Act, it is true that it provides, broadly, that the district court "shall have exclusive jurisdiction of civil actions on claims against the United States, for money damages. . . ." This confers jurisdiction to render judgment upon all such claims, but it does not say that all claims must be allowed. Jurisdiction is as necessary to deny a claim on its merits as it is to adjudge that liability exists. We interpret the language of the statute to mean all that it says but no more, said the Supreme Court. Jurisdiction of the defendant now exists where the defendant was immune from suit before; it remains for the courts to determine whether or not any claim has merit. For this purpose, the Act goes on to prescribe the test of allowable claims, which is, "The United States shall be liable . . . in the same manner and to the same extent as a private individual under like circumstances. . . ." It will be seen, said the Supreme Court, that this is not the creation of new causes of action but acceptance of liability under circumstances that would bring private liability into existence. One obvious shortcoming in the present claims is that the plaintiffs can point to no liability of a "private individual" even remotely analogous to that which they are asserting against the United States. We know of no American law which ever has permitted a soldier to recover for negligence, against either his superior officers or the government he is serving. The nearest parallel would be the relationship between the states and their militia. But even if we indulge plaintiffs the benefit of this comparison, they cite us, and we know of, no state which has permitted members of its militia to maintain tort actions for injuries suffered in service, and in at least one state the contrary has been held to be the case. We find no parallel liability before and we think no new one has been created by this Act.

The relationship between the Government and members of its armed forces is "distinctively federal in character." No federal law recognizes a recovery such as claimants seek. This Court in deciding claims under the Tort Claims Act for wrongs incident to military service cannot escape attributing some bearing to enactments by Congress which provide systems of simple, certain, and uniform compensation for injuries or death of those in the armed services.

We conclude, therefore, said the Supreme Court, the Government is not liable under the Federal Tort Claims Act for injuries to service men where the injuries arise out of, or are in the course of, activity incident to service. Without exception, the relationship of military personnel to the Government has been governed exclusively by federal law. We do not think that Congress, in drafting this Act, created a new cause of action dependent on local law for service-connected injuries or death due to negligence. We cannot impute to Congress such a radical departure from established law in the absence of express congressional command.

Accordingly the judgment of the appellate court in the Jefferson case, holding that the service man had no right to recover from the United States under the Tort Claims Act for the negligence of an army surgeon, was affirmed; the judgment in the Griggs' case holding that a cause of action existed was reversed.—*Feres v. United States, Jefferson v. United States, United States v. Griggs, 71 S. Ct. 153 (1950).*

Optometry Practice Acts: Constitutionality of Regulatory Provisions (New Jersey).—The plaintiff filed a complaint under the declaratory judgment act asking that the optometry practice act, or specific portions thereof, be adjudged unconstitutional and void as unduly restrictive of the right of private property and an arbitrary exercise of the police power. The trial court entered a judgment construing the statute and both the plaintiff and the defendant appealed to the Supreme Court of New Jersey.

It is conceded that the practice of optometry is subject to regulation under the police power but the plaintiff's insistance is (1) that the calling is not a "learned profession," but rather a "statutory profession" falling into the category of "occupations and businesses" reasonably regulable only in the particular areas in which the subject matter touches "the health or welfare of the community;" and (2) that certain sections of the amendatory act of 1948 are wholly without relevancy to the public health, but serve the pecuniary interest of the optometrists alone, and so constitute a deprivation of property without due process of law in contravention of the Fourteenth Amendment of the Federal Constitution.

While not an oculist or an ophthalmologist, said the Supreme Court, an optometrist is not a tradesman, or craftsman, but a practitioner in a specialized field of physical science intimately identified with the public health, even though he is not trained in pathology. The practice of optometry involves, not alone the measurement of the powers of vision, but also diagnosis and prescription for the revealed ocular deficiency or deformity or visual or muscular anomaly of the eye and this calls for scientific knowledge of the anatomy of the eye and the principles of physical optics, the area of physics relating to the direction, reflection and refraction of light. Thus, the court continued, by its very nature, the practice of optometry is subject to regulation for the protection of the public against ignorance and incapacity and deception and fraud, equally with the practice of ophthalmology and the other "learned professions." In the regulation of professions, the state may ban practices and procedures tending to unseemly competition and the lowering of the standards of service.

The provision of the optometry practice act (R. S. 45:12-9) barring the issuance of more than two branch office registration certificates to one licensee, is assailed as an unreasonable exercise of the police power. The trial court reasoned that this limitation had no bearing upon the "public health or interest" and thus denied or unreasonably curtailed the common right to engage in a lawful business in violation of the Fourteenth Amendment of the Federal Constitution. The Legislature, said the Supreme Court, rejected the multiple shop or "chain store" principle as alien to the practice of optometry; and this was well within the range of legislative discretion to serve the statutory policy. The optometrist exercises professional skill and judgment and it is readily conceivable that this limitation was designed to insure an adequate measure of personal performance and supervision in keeping with the nature of the service and the avoidance of the evils of competition which has its place in trade and mercantile pursuits but not in the practice of this profession.

Another section of the optometry act (R. S. 45:12-11 (h)) empowers the administrative authority to refuse a license to practice optometry or to revoke or suspend a license granted for: "False, fraudulent or misleading advertising of the practice of optometry or of any art, skill, knowledge, method of treatment or practice pertaining thereto;" provided that nothing therein contained "shall be construed to prohibit" a licensee from displaying his "name on the premises" where he is engaged in practice, if "the information is limited to that of the professional card" and the lettering is not larger than four inches in height for street-level offices and six inches for offices above street level. The proviso makes illumination of the lettering permissible only during office hours; and the use of colored or neon lights is forbidden, also the "display" of "any eyeglass or eye sign, whether painted, neon, decalcomania, or any other, either in the form of eyes, or structure resembling eyes, eyeglass frames or eyeglasses or spectacles." Rules adopted by the administrative agency forbid, on penalty of revocation or suspension of the practitioner's license, the advertising of the price of spectacles, eyeglasses or lens, frames or mountings, the free examination of eyes, and terms of payment. It is said that there is no relationship between the body of the subsection of the statute and the proviso; and that a transgression of the restrictions of the proviso would not constitute "false, fraudulent or misleading advertising;" and that the statute does not embody a norm or standard to guide the administrative authority "in deciding what is false, fraudulent or misleading as these words are used and then enlarged by the act itself," and is "so vague and indefinite" as to constitute a delegation of legislative power. The phrase "false, fraudulent or misleading advertising," said the Supreme Court, constitutes a standard of conduct sufficiently definite and certain to permit of enforcement by the administrative agency without trenching upon the legislative domain. Generally, it embraces advertising that is intentionally false, deceitful or delusive or calculated to lead astray or to cause error. There can be no difficulty in classifying conduct in relation to this standard. That category does not embrace advertising that is entirely devoid of these elements; it does not serve to bar all advertising, however, truthful, merely because advertising in itself is not deemed good professional practice.

Objection is also raised to R. S. 45:12-11 (o). This section provides that the administrative agency may refuse, revoke or suspend a license to practice optometry for "any conduct which, in the opinion of the board, is of a character likely to deceive or defraud the public." The conduct thus inhibited, said the Supreme Court, is not that which in law and in fact is of a character likely to "deceive or defraud the public," words of definite and certain meaning, but that which "in the opinion of the board" is of that character. This subjective test of conduct meriting disapproving action is so vague, indefinite, and uncertain as to render the provision void for want of due process. It is not sufficiently explicit to inform those subject to action thereunder as to the conduct which will render them liable to its penalties.

Another section (R. S. 45:12-18.1) provides that the optometric record of the patient's examination, including "all findings and pertinent facts concerning the patient discovered and disclosed during the course of such examination, as well as the record of professional services rendered and the fees charged therefor shall, because of the confidential nature in the relationship, be the exclusive property of the optometrist who rendered the professional services to the patient;" and that "any unauthorized use by any other person, firm or corporation of the information contained therein shall constitute an infringement of the property rights of the patient and the optometrist." It is argued that this provision "is for the benefit of the optometrist and not that of the public as it should legally be;" and it is suggested that the plaintiff corporation has a pecuniary interest in retaining possession of the optometric record as against its employed optometrists. The statutory license to practice optometry is individual and personal, said the Supreme Court. It is founded upon demonstrated scientific knowledge and professional skill. There is no provision for the issuance of such a license to a body corporate. There are obvious reasons of policy for vesting the property in the record in the optometrist who actually rendered the service to the patient. The relation between the optometrist and his patient is personal and confidential and subject to reasonable legislative regulation in the common interest. The regulation cannot be deemed arbitrary or unreasonable.

Accordingly the Supreme Court entered judgment in accordance with the foregoing opinion.—*Abelson's Inc. v. New Jersey State Board of Optometry, 75 A (2d) 867 (New Jersey 1950).*

Chemical Tests for Intoxication: Physician's Opinion as to Reliability.—The defendant was charged with driving an automobile upon a public highway while intoxicated and was found guilty by a jury. From this judgment of guilt, he appealed to the court of criminal appeals of Texas.

Only one exception was raised by the record, said the court of criminal appeals. It appears that on defendant's arrest, he voluntarily gave a specimen of his urine. This specimen was analyzed by a chemist, who later testified without objection that such specimen contained 0.34 per cent of alcohol. Thereupon, Dr. W. A. Newton, a physician but not a chemist, testified that from reading and study and from certain documents relative to such matters, he was of the opinion that 0.34 per cent alcohol shown in a chemical analysis of urine was evidence that intoxication was present in the giver of the specimen. This testimony was objected to as hearsay and as conclusion of the witness. We think, said the court of criminal appeals, that under the facts here present such testimony was admissible and that the objection went to the weight of the evidence rather than to its admissibility. Accordingly the judgment of conviction was affirmed.—*House v. State, 233 S. W. (2d) 862 (Texas 1950).*

MEDICAL LITERATURE ABSTRACTS

A.M.A. Archives of Pathology, Chicago

50:657-884 (Dec.) 1950. **Partial Index**

Bibliography of Writings of Dr. Leo Loeb From 1896 to 1949.—p. 663.
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Studies on Aging Processes in Endocrine Glands of Guinea Pig: II. Effects of Estrogen and Progesterone on Thyroid, Parathyroid and Adrenal Glands of Male and Female Guinea Pigs of Various Ages. H. T. Blumenthal.—p. 687.
*Studies of Early Uterine Carcinomas Discovered by Cytological Examination of Vaginal Contents. E. L. Burns, W. H. Hartung Jr. and E. Brittingham.—p. 699.
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Studies on Acute Toxic Effects of 4-Amino-Pterolyglutamic Acid in Dogs, Guinea Pigs and Rabbits: Difference in Species Susceptibility and Protective Action of Folic Acid. V. Minnich, C. V. Moore, D. E. Smith and G. V. Elliott.—p. 787.
Movement of Water in Interstitial Tissue and in Muscle Removed from Body. E. L. Opie and M. B. Rothbard.—p. 800.
Cancer and Aging: Survey of Autopsy Records of Municipal Hospital over 15 Year Period. J. A. Saxton Jr., F. P. Handler and J. Bauer. —p. 813.
Effects of High Fat Diet on Joints of Aging Mice. M. Silberberg and R. Silberberg.—p. 828.
Immunity in Scrub Typhus: Resistance to Induced Reinfection. J. E. Smadel, Capt. H. L. Ley Jr., Lieut. F. H. Diercks and Maj. R. Traub. —p. 847.
*Inclusion Disease or Generalized Salivary Gland Virus Infection. M. G. Smith and F. Vellios.—p. 862.

Cytology of Vaginal Contents.—Burns and associates report on the Toledo program for early detection of uterine cancer, which involves pelvic and cytological examinations of the vagina of every woman in the area at intervals of six months to a year. From 1946 to 1950, examinations of 6,437 patients were made and 9,205 smears were taken. Of these patients, 74 (1.14 per cent) were proved to have uterine carcinoma. Smears led to erroneous diagnoses in only 36 patients, on the basis of 18 false negative and 18 false positive results. Of the 74 patients shown to have uterine carcinoma, 22 were not suspected of having it either from clinical symptoms or from the results of pelvic examination. The first evidence of neoplasm was given by the vaginal smear. Studies of age incidence in the 22 unsuspected cases as compared with the 52 suspected cases showed the average age of patients and the decade incidence of carcinoma of the cervix to be lower in the unsuspected group. This suggests that, in the development of some invasive cervical cancers, there is a latent period during which carcinomatous changes develop in, and are limited to, the cervical epithelium. Histological studies on nine uteri removed for early carcinoma of the cervix showed in some cases multiple, widely separated foci of atypical hyperplasia of the stratified squamous epithelium. This suggests that carcinoma may develop in the vaginal area after total extirpation of the uterus and emphasizes the need for follow-up studies of patients so treated. Such studies should include repeated examinations of vaginal smears.

Inclusion Disease.—Smith and Vellios report on 20 cases of inclusion disease of infants and children. Sixty-nine previously reported cases of the disease are also analyzed and compared with these. The authors conclude that most generalized salivary gland virus infections occur during the first two years of life. The infection may occur in utero without the mother showing any evidence of disease. In prenatal infections, death may occur in utero or in the neonatal period. In infants less than 2 months old, the disease is usually primary and fatal. Its most frequent clinical and anatomic manifestations are a blood dyscrasia or hepatic damage. The character of the disease may vary, since the infection may involve, with variable intensity, many organs of the body. In children over 2 months old, inclusion disease is associated with diverse clinical histories and anatomic changes. At times it is the principal disease; more often it is associated with another primary disease and plays only a minor role in the child's illness. The association of pertussis and generalized salivary gland virus infection in approximately one third of the cases, including the 20 cases reported in this study, remains unexplained. There is evidence that disturbances of cellular metabolism, such as those occurring in vitamin deficiencies, may predispose to inclusion disease.

A.M.A. Archives of Surgery, Chicago

61:977-1162 (Dec.) 1950

*Parenteral Nutrition in Surgery: Significance of Calories and Protein in Maintaining Positive Nitrogen Balance. C. O. Rice, B. Orr, A. E. Treloar and J. H. Strickler.—p. 977.
Ruptures of Surface Blood Vessels on Cerebral Hemispheres as Cause of Subdural Hemorrhage. B. M. Vance.—p. 992.
Surgical Implications of Lower Thoracic and Lumbar Independent Sympathetic Pathways. A. Kuntz and W. F. Alexander.—p. 1007.
Mesenchymal Tumors of Stomach. C. J. France and O. A. Brines. —p. 1019.
Action of Various Pharmacologic and Other Agents on Colon of Man. W. J. Grace, C. W. Holman, S. Wolf and H. G. Wolff.—p. 1036.
Carcinoma of Lung. W. E. Burnett, G. P. Rosemond, J. H. Hall and H. T. Caswell.—p. 1052.
Evaluation of Colostomy for Present Day Surgery: Review of 4,939 Cases of Injury of Colon and Rectum. D. H. Poer.—p. 1058.
Esophageal Leiomyomas: Report of Additional Case. D. J. Dugan and T. Meagher.—p. 1066.
Clinical Evaluation of Analgesic Drugs: Comparison of Nu-2206 and Morphine Sulfate Administered to Postoperative Patients. R. S. Jaggard, L. L. Zager and D. S. Wilkins.—p. 1073.
Meckel's Diverticulum: Review of Literature and Report of Unusual Case. W. H. Merritt and M. A. Rabe.—p. 1083.
Islet Cell Adenoma: Three Cases, One Extrapancreatic, Cured by Operation. D. B. Pfeiffer and D. B. Miller.—p. 1096.
Functional Pathology of Certain Cardiovascular Malformations Which May Be Treated Surgically. J. E. Edwards.—p. 1103.
Sacrococcygeal Teratoma in the Newborn. J. M. Walker Jr. and R. J. P. Foster.—p. 1138.
Use of Detergent (pHisoderm®) Combined with Hexachlorophene for Skin Disinfection. B. S. Freeman and T. K. Young Jr.—p. 1145.
Effect of Pancreatectomy on Phospholipid Synthesis in Dog. W. F. Barker, K. E. Rogers and F. D. Moore.—p. 1151.

Parenteral Nutrition in Surgery.—Nitrogen balance studies were done in 28 surgical patients while all nutrition was being received intravenously. Nitrogen was provided in the form of amino acids, and calories were obtained from dextrose and alcohol. Amounts of each were varied experimentally. It was found that adequate caloric intake is essential for economic utilization of parenterally administered amino acids. Nitrogen equilibrium can be obtained without adequate calories if relatively more nitrogen is provided. Adequate daily carbohydrate, amino acids and calories can be obtained from 3,000 cc. of a solution containing 5 per cent dextrose, 5 per cent amino acids and 7.5 per cent alcohol, without excessive hydration of the patient. The authors have established a curve that can be used to prognosticate, with sufficient accuracy for clinical

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Titles marked with an asterisk (*) are abstracted.

use, the nitrogen balance to be anticipated when the caloric intake, the nitrogen intake and caloric requirements are known. The caloric needs of the patient can be calculated mathematically with the aid of the duBois chart. The curve shows that with a constant proportion of calories from protein the nitrogen balance increases as the total calories increase in relation to the metabolic requirements. These studies suggest that a positive nitrogen balance can be readily obtained if adequate calories are provided with an average amount of protein. As the amount of food that can be eaten by sick persons is limited, it is clinically feasible to supplement the deficiency with parenterally administered dextrose, amino acids and alcohol.

American Journal of Orthopsychiatry, New York

20:667-888 (Oct.) 1950. Partial Index

Aggression. B. Karpman.—p. 694.
Study of Aggressive Sex Misbehavior in Adolescents Brought to Juvenile Court. O. B. Markey.—p. 719.
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American Journal of Pathology, Ann Arbor, Mich.

26:969-1144 (Nov.) 1950

Endocardial Fibro-Elastosis: Study of Eight Cases. J. T. Prior and T. C. Wyatt.—p. 969.
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Local Cellular Responses in Experimental Hypersensitivity. D. M. Angevine and C. V. Seastone.—p. 1011.
Unusual Glomerulonephritis in Young Children, Probably Radiation Nephritis: Report of Three Cases. W. W. Zuelzer, H. D. Palmer and W. A. Newton Jr.—p. 1019.
*Pathology of Fatal Carbon Tetrachloride Poisoning: With Special Reference to Histogenesis of Hepatic and Renal Lesions. H. D. Moon. —p. 1041.
Local Gigantism (Manifestation of Neurofibromatosis): Its Relation to General Gigantism and to Acromegaly. Illustrating Influence of Intrinsic Factors in Disease when Development of Body Is Abnormal. K. Inglis.—p. 1059.
Etiology of Lateral Nasal Clefts. W. Stupka.—p. 1085.
Observations on Reduction of Triphenyl Tetrazolium Chloride by Normal and Malignant Human Tissue. M. M. Black, S. R. Opler and F. D. Speer.—p. 1097.
Structure and Iodine Content of Thyrotoxic Goiters in Iceland. J. Sigurjonsson.—p. 1103.

Pathology of Fatal Carbon Tetrachloride Poisoning.—Moon describes the pathological changes in 12 cases of fatal poisoning from carbon tetrachloride. The interval between exposure and death, from four to 18 days, afforded an opportunity for study of morphological changes at various stages. Seven persons ingested carbon tetrachloride accidentally or with suicidal intent; five inhaled the fumes of carbon tetrachloride. No significant differences were observed in the lesions resulting from these two types of exposure. All but one of the 12 persons had acute or chronic alcoholism. The frequent association of alcoholism and fatal carbon tetrachloride poisoning indicates that alcohol and carbon tetrachloride have a synergistic, nephrotoxic and hepatotoxic effect. The hepatic lesions in persons dying soon after exposure were extensive, but their severity diminished with longer periods of survival. This is believed to be due to less severe initial injury and to rapid regeneration following injury. The renal lesions in persons dying within a few days after exposure were relatively slight and involved primarily the proximal convoluted tubules. These changes became progressively more pronounced with longer periods of survival. An inverse relation was noted between the severity of the hepatic and the renal lesions. Pulmonary edema was present consistently and was greater in those who survived for longer periods.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

34:501-590 (Nov.) 1950

Hyaluronidase and Experimental Syphilis: III. Metachromasia in Syphilitic Orchitis and Its Relationship to Hyaluronic Acid. V. Scott and G. J. Dammin.—p. 501.
Studies on Life Cycles of Spirochetes: II. Development of New Stain. E. D. DeLamater, M. Haanes and R. H. Wiggall.—p. 515.
Investigations of Psychological Processes in Patients with Neurosyphilis. T. H. Sternberg, M. C. Zimmerman and others.—p. 519.
Clinical Psychometric Procedure in Recognition of Early Dementing Paresis. B. I. Lewis.—p. 534.
*Neurosyphilis IV. Posttreatment Evaluation Four to Five Years Following Penicillin and Penicillin plus Malaria. A. C. Curtis, W. T. Kruse and D. H. Norton.—p. 554.
*Penicillin Alone in Neurosyphilis: Spinal Fluid Response Including Comparison with Prepenicillin Therapy. N. R. Ingraham Jr., J. H. Stokes, G. D. Gammon and others.—p. 566.
Effect of Previous Antisyphilitic Treatment on Present Treatment, as Indicated by Records from Nation-Wide Study of Penicillin in Syphilis. R. V. Rider.—p. 581.
Oral Terramycin in Treatment of Gonorrhea in Male. R. C. V. Robinson.—p. 587.

Evaluation of Penicillin and Penicillin plus Malaria in Neurosyphilis.—Curtis and his co-workers report on 430 patients with neurosyphilis who were observed for one to five years following a single course of treatment. The four types of neurosyphilitic involvement were asymptomatic and meningovascular neurosyphilis, tabes dorsalis and paresis (plus taboparesis). Only penicillin was given to 221 patients (51 per cent), and 209 (49 per cent) received penicillin plus malariotherapy. Treatment consisted of a total dose of 4,000,000 units of aqueous penicillin given intramuscularly in doses of 40,000 units every three hours for 100 injections (12½ days). When fever therapy was used concurrently with penicillin, therapeutic tertian malaria was induced and the patient's temperature was maintained above 103.5 F. (rectal) for 50 hours or more. There was no significant difference, clinically and in ability of the patient to work, between the results obtained with penicillin alone and penicillin plus malariotherapy. Spinal fluid tests gave similar results, except for superiority of penicillin plus malariotherapy in reversing the precipitation (Kahn) test in a group of patients with paresis. However, there was no correlation between normal spinal fluid and good clinical results. Autopsy observations confirmed the fact that there is little histological evidence of residual neurosyphilis in penicillin-treated patients. The authors conclude that penicillin alone is adequate in all types of neurosyphilis except in severe paresis and possibly in optic atrophy.

Penicillin Therapy in Neurosyphilis.—Ingraham and associates report on 603 cases of neurosyphilis, classified as paresis and taboparesis (124 cases), meningovascular neurosyphilis (122 cases), tabes dorsalis (229), and asymptomatic neurosyphilis (125) cases. The patients were observed for seven years after treatment with various dosages and types of penicillin. These ranged from a single course of 1,200,000 units of aqueous amorphous penicillin to 10,000,000 units or more of either aqueous preparations or penicillin in an absorption-delaying vehicle. The spinal fluid response was most rapid in the first year after penicillin therapy in all types of neurosyphilis. The percentage of normal and near normal fluid tended to level off during the third year. The response was slowest and least satisfactory in paresis and taboparesis and most satisfactory in tabes dorsalis. Fifty-five per cent of patients with paresis and taboparesis and 60 to 70 per cent of those with tabes dorsalis had normal or near normal spinal fluid by the fifth year. Spinal fluid "relapse" occurred after the third or fourth year in 5 per cent (usually in paresis, taboparesis or tabes). Increase in the total dose of penicillin, either in a single course or by a series of courses, did not greatly influence the ultimate result. The optimum dosage approximated 5,000,000 units of aqueous sodium penicillin G. Repeated courses of penicillin are of little value, so far as spinal fluid response is concerned, after the initial satisfactory response. It was shown that procaine penicillin in an absorption-delaying vehicle was equal to aqueous penicillin in inducing spinal fluid response during the first year after treatment, but its good effects are less lasting. The authors also report on 146 patients with neurosyphilis treated in prepenicillin days. They concluded that the various forms of fever therapy and chemotherapy gave a similar,

though slower, type of spinal fluid response to that observed with penicillin therapy. The maximum sustained response was reached one to two years earlier when penicillin was used. Of the 603 patients treated with penicillin, 30 died during the seven year observation period. Syphilis was a contributory cause of death in only five of these; there were no deaths due to penicillin reactions.

Annals of Western Medicine & Surgery, Los Angeles

4:665-770 (Nov.) 1950

*Role of Liver in Atherosclerosis. L. M. Morrison.—p. 665.
Liver in Atheromatous Syndrome. J. B. Wolffe, A. S. Hyman, M. B. Plungian and others.—p. 679.
*Recent Trends in Management of Parotid Tumors: Report of 100 Cases. C. E. Nelson and P. H. Deeb.—p. 683.
Investigation on Care and Treatment of Poliomyelitis Patients: Part II. Physiological Studies of Various Treatment Procedures and Mechanical Equipment. A. G. Bower, V. R. Bennett, J. B. Dillon and B. Axelrod. —p. 686.
*Treatment of Non-Specific Ulcerative Colitis with Aureomycin. L. T. Wright, S. Strax and J. A. Marks.—p. 717.
Precancerous and Cancerous Lesions in Lower Bowel: Incidence in 500 Asymptomatic Patients. W. M. Yater and V. T. Young.—p. 726.
Diagnosis of Pulmonary Embolism. J. F. McNabb.—p. 729.
Varicose Veins: Part III. Current Therapy. A. Fields.—p. 738.
Patella Cubuti with Fracture. J. W. Birsner and D. H. DeSmet.—p. 744.
Retrolental Fibroplasia: Recent Advances and Recommendations. A. Appelbaum.—p. 746.
Report on Chest Tumor Suspects from the Los Angeles County Mass Chest X-Ray Survey by the Cancer Committee of the Los Angeles County Medical Association. L. W. Guiss.—p. 751.

The Liver in Atherosclerosis.—Morrison concludes that atherosclerosis is a manifestation not of age but of disturbed lipid metabolism, in which the liver plays a significant role. The incidence of arteriosclerosis is increased in diseases associated with hyperlipemia or hypercholesteremia, e. g., hypothyroidism, xanthomatosis and diabetes mellitus. The author found that serum cholesterol levels were elevated in a high percentage of 200 unselected patients with acute coronary sclerosis, and that the cholesterol content of the coronary arteries was four times higher than normal in patients who died of coronary thrombosis. The serum cholesterol levels fluctuated strikingly in contrast to those of healthy subjects, which remained constant over long periods. The author suggests that such fluctuations, demonstrated by the Sperry-Schoenheimer procedure, may be due to a disturbance of liver function. He describes experimental studies on choline chloride, a lipotropic substance whose action is mediated through the liver, and tests its effect in atherosclerosis produced by cholesterol feeding in animals. Finally, he demonstrates that choline has a therapeutic effect in human atherosclerosis. Choline was given for three years to 115 patients with coronary atherosclerosis. The mortality rate in this group was significantly lower than that in a similar group of 115 patients with coronary sclerosis who did not receive choline. Further therapeutic trials are indicated.

Management of Parotid Tumors.—According to Nelson and Deeb, the results of treatment in tumors of the parotid gland can be improved by earlier and more adequate surgery. The recurrence rate is high: 25 per cent in the authors' series of 100 tumors (43 of them malignant) and from 20 per cent to 60 per cent in other series. Two basic misconceptions are responsible for the inadequate surgical procedures that have led to this high recurrence rate: (1) the idea that the facial nerve passes through the substance of the parotid gland and (2) that mixed tumors of the parotid have a true capsule. Although textbooks teach that the facial nerve enters the parotid, McWhorter and others have shown that this is not so. The gland is made up of a larger external lobe, a short isthmus and a smaller deep lobe. The facial nerve does not enter the substance of the gland but passes under the outer lobe and divides into two main branches that pass on either side of the isthmus. These divide into many smaller branches that continue along the medial surface of the external lobe to emerge anteriorly. Thus it is possible to remove the entire parotid gland without destruction of the nerve, and this is the operation of choice in smaller potentially malignant tumors, in many of the larger mixed tumors and in tumors extending into the deeper lobe. In gross involvement of the main trunk of the nerve, especially where malignancy is suspected, the nerve is sacrificed. Occasionally, it is possible to save a stump of the main trunk and part of each division for primary nerve suture. The misconception of the nature of the capsule in mixed tumor of the parotid has also caused many surgical errors. There is no true capsule but a pseudocapsule made up of compressed parotid tissue. Small extensions of the tumor often pass through this tissue and are not removed if the tumor is simply "shelled out." Still another reason for inadequate surgical procedure is confusion of some of the soft, boggy parotid tumors, many of which are malignant, with sebaceous cysts, parotid cysts and chronic infections.

Aureomycin in Ulcerative Colitis.—Thirty patients with ulcerative colitis were treated with aureomycin. Of these, 13 were reported previously; the remaining 17 treated since are reported on in this paper. The usual dose of aureomycin was 250 mg., given every eight hours. If there was no improvement after one or several weeks, the dosage was doubled. When much improvement had been achieved, it was reduced. If there was nausea, milk or a bismuth subsalicylate mixture (pepto-bismol®) was given. In the 30 cases so far treated, 25 had reduction in bowel movements of 50 per cent or more. Gross blood disappeared from the stools in 21 of 26 cases. Twenty-six patients said they felt much better. Thirteen patients gained from 3 to 28 pounds (1.3 to 12.7 Kg.), whereas four lost some weight. Results of sigmoidoscopic examination were improved in 12 of 29 patients. Of 12 patients who could be followed for a year, eight were well; in the other four, one or more recurrences of diarrhea were controlled with aureomycin. While the results are encouraging, the authors urge caution in evaluation of this therapy and suggest that when medical treatment fails surgical intervention is indicated.

Arkansas Medical Society Journal, Fort Smith

47:83-94 (Oct.) 1950

Cardiac Function and Emotional States. L. F. Bishop Jr.—p. 83.
Serious Complication of Thrombophlebitis in Saphenous Varicosities. F. G. Kumpuris and A. Kahn.—p. 86.

47:95-108 (Nov.) 1950

Amebiasis: Its Diagnosis and Treatment. F. M. Acree.—p. 95.
Corneal Transplant. K. W. Cosgrove.—p. 98.

Cancer, New York

3:945-1122 (Nov.) 1950. **Partial Index**

Incidence of Cancer in American Males: 15,000,000 Man-Years of Aggregate Experience, United States Army, 1944-1945. D. Lindsey and E. M. Cohart.—p. 945.
Epidemiological Aspects of Cancer of Cervix: II. Hereditary and Environmental Factors. H. L. Lombard and E. A. Potter.—p. 960.
Carcinoma of Cervix Uteri in Identical Twins. B. W. Stocking.—p. 969.
Partial and Complete Pelvic Exenteration: Progress Report Based upon First 100 Operations. A. Brunschwig and V. K. Pierce.—p. 972.
Technique of Radical Hysterectomy for Carcinoma of Cervix. G. H. Twombly.—p. 975.
Biological Half-Life of Radioactive Phosphorus in Blood of Patients with Leukemia. H. Tivey and E. E. Osgood.—p. 992.
Thyroid Cancer in Childhood and Adolescence: Report on 28 Cases. B. J. Duffy Jr. and P. J. Fitzgerald.—p. 1018.
Ameboid Motility of Human and Animal Neoplastic Cells. H. T. Enterline and D. R. Coman.—p. 1033.
Jejunal Leiomyosarcoma in Newborn. D. Roth and C. J. Farinacci. —p. 1039.
*Carcinogenicity of Fat "Browned" by Heating. A. Lane, D. Blickenstaff and A. C. Ivy.—p. 1044.
Use of Ehrlich Ascites Tumor of Mice for Quantitative Studies on Growth and Biochemistry of Neoplastic Cells. G. Klein.—p. 1052.
Cytotoxic Effects of Nitrofuran on Rat Testis. J. T. Prior and J. H. Ferguson.—p. 1062.
Susceptibility of Suckling-Infant, and Resistance of Adult, Mice of C3H and of C57 Lines to Inoculation with Ak Leukemia. L. Gross. —p. 1073.
Carcinoma of Gallbladder: Attempt at Experimental Production. G. Desforges, J. Desforges and S. L. Robbins.—p. 1088.

Carcinogenicity of Heated Fat.—In an attempt to explain the high incidence of gastric carcinoma, Lane and associates investigated the possible carcinogenic action of a common item of diet, heated fat. Roffo of Buenos Aires had already obtained papillomas of the forestomach and malignant tumors of the glandular stomach by feeding rats with fat preheated to 350 C. The authors fed browned lard, preheated to 350 C. for 30 minutes, to 54 rats from Roffo's colony for 18 to 24 months. Papillomas of the forestomach and ulcers of the glandular stomach occurred in 37 per cent of these animals and in 5.7

per cent of a control group fed unheated lard. These lesions usually occurred after an animal was 12 months old. No malignant tumors of the glandular stomach were produced. This may have been due to the fact that gastric carcinoma, according to Roffo, requires 22 months to develop and only 12 of Lane's animals lived that long. Heated lard or vegetable oil was then injected subcutaneously in 31 rats, who were observed for 12 to 18 months. Three malignant sarcomas developed in this group, while none developed in a control group of 150 rats. Apparently lard heated to 350 C. for 30 minutes contains a cancerogenic substance that acts subcutaneously in mice.

Diseases of Chest, Chicago

18:401-520 (Nov.) 1950

Extraperiosteal Temporary Plombage in Thoracoplasty: Preliminary Report. F. M. Woods, J. H. Walker and I. Schmidt.—p. 401.
*Preliminary Report of Clinical Experience with P-Aminosalicylic Acid. N. H. DeJanney, J. Cox and E. Grindell-Balchum.—p. 413.
Studies on Behavior of Para-Aminosalicylic Acid in Tuberculous Pleural Effusions. S. H. Lawrence and N. Comden.—p. 430.
Aerosols II: Role of Particle Size in Inhalation Therapy by Atomization and by Penicillin Dusts. H. A. Abramson.—p. 435.
Aspiration of Pleural Fluid. M. Braverman.—p. 450.
*Non-Bacterial Pneumonias. J. T. Syverton.—p. 456.
Medical Management of Acute Lung Abscess: Report of 12 Cases. J. S. Jewett and G. E. Dimond.—p. 478.
The BCG Controversy. L. B. Dickey.—p. 502.
Tuberculosis Control in Institutions for Mentally Ill. E. W. Miller. —p. 508.

Paraaminosalicylic Acid in Tuberculosis.—Clinical evaluation of paraaminosalicylic acid (PAS) as a bacteriostatic agent in tuberculosis was carried out on 42 patients, 40 with pulmonary tuberculosis and two with tuberculous meningitis. All had far advanced disease, and all but six had cavitation. Eighty per cent had been treated unsuccessfully with streptomycin. Paraaminosalicylic acid was given in the form of pamisyl® tablets, 9.6 to 10.5 Gm. daily, divided in five doses. Higher dosage was not tolerated by most patients, and even at the lower dosage 64.3 per cent of patients showed signs of toxicity (anorexia, nausea, vomiting, diarrhea and weight loss). Therapy was continued in most cases for 90 to 120 days. Symptomatic improvement was obtained in 52.4 per cent of the patients, and clinical and roentgen improvement in 67.5 per cent. Endobronchial lesions of five of the patients with pulmonary tuberculosis healed completely. Pronounced clinical and spinal fluid improvement occurred in the two patients with tuberculous meningitis. Both had previously become resistant to streptomycin. Evidence of resistance to paraaminosalicylic acid appeared in some cases after about four months of treatment. It is suggested that paraaminosalicylic acid be used when streptomycin resistance appears and vice versa. Collapse therapy, when indicated, should be given near the beginning of a course of paraaminosalicylic acid, before the drug has lost its effectiveness.

Nonbacterial Pneumonia.—Syverton reviews current knowledge concerning nonbacterial pneumonia. He estimates that from 5 to 70 per cent of all pneumonia is nonbacterial. The causative agents include not only viruses (e. g., those causing influenza, psittacosis, lymphocytic choriomeningitis) and probable viruses (atypical pneumonia and acute catarrhal fever) but also rickettsia (Q fever), fungi (histoplasmosis and coccidioidmycosis), protozoa (toxoplasmosis) and allergens (bagassosis and, possibly, Loeffler's syndrome). The pathological, roentgenologic and clinical pictures are essentially the same for this wide range of etiological entities. The basic process is an interstitial pneumonitis. This produces on the roentgenogram a unilateral or bilateral increase in bronchovascular markings, with radial extension outward of soft, mottled shadows that increase in size over a period of days to become irregularly confluent. Symptoms consist of cough, malaise, headache and chills, sometimes associated with coryza and sore throat. In every case of pneumonia, before antibiotic therapy is begun, an attempt should be made to establish a specific etiological diagnosis by isolation of the organism (bacterium, virus, fungus or other agent). This will prevent much needless and wasteful therapy.

International Journal of Leprosy, New Orleans

18:299-450 (July-Sept.) 1950

*Preliminary Report on 4: 4'Diaminodiphenyl Sulfone (DDS) Treatment of Leprosy. E. Muir.—p. 299.
Intramuscular Administration of Sulphetrone in Treatment of Leprosy. M. B. Dharmendra, N. C. Dey, R. Bose and P. L. Kapur.—p. 309.
Studies of Absorption, Excretion and Distribution in Body of Sulfones Used in Treatment of Leprosy. H. Ross.—p. 333.
Effects of Sulphetrone Treatment in Fiji. C. J. Austin.—p. 345.
Visceral Tuberculoid Leprosy. J. Campos R. de C. and M. Molina S. —p. 351.
Leprosy and Leprosy Work in East Africa. J. R. Innes.—p. 359.
Note on Leprosy in Liberia. H. A. Poindexter.—p. 369.
Reactions to Tuberculins in Leprosy: Review. H. W. Wade.—p. 373.

Treatment of Leprosy with 4,4' Diaminodiphenylsulfone (DDS).—Muir reports the clinical and bacteriologic results obtained in 94 lepers treated with 4,4'diaminodiphenylsulfone, the parent substance of the sulfones. Definite clinical improvement was obtained in 96 per cent and much improvement in 48 per cent of the 50 patients, who were treated for over nine months. While it is too soon to make conclusions, there is evidence that diaminodiphenylsulfone gives results similar in many respects to those obtained with the compound sulfone derivatives. There is, apparently, a sufficient gap between the effective dose and the toxic dose to make treatment safe. The oral method of administration has been used and is recommended, but further evidence is required for determination of its advantages over intramuscular injection of an oily suspension. A combination of the two methods may possibly be better than either alone. Because of the small size of the effective dose and the relative simplicity of the structure of this drug, therapy with it is relatively cheap and thus available to the poor.

Journal of Bone and Joint Surgery, Boston

32A:721-1002 (Oct.) 1950

Surgical Treatment of Fresh Injuries to Major Ligaments of Knee. D. H. O'Donoghue.—p. 721.
Experimental and Clinical Use of Oxidized Cellulose and Cortisone in Prevention of Excess Bone and Fibrous-Tissue Formation. F. E. Stinchfield.—p. 739.
Changes in Scoliotic Spine After Infusion. I. V. Ponseti and B. Friedman. —p. 751.
Legg-Perthes Disease: Method for Measurement of Roentgenographic Result. C. H. Heyman and C. H. Herndon.—p. 767.
Sling Procedure for Correction of Splay-Foot, Metatarsus Primus Varus, and Hallux Valgus. R. J. Joplin.—p. 779.
*Well-Leg-Raising Test of Fajersztajn in Diagnosis of Ruptured Lumbar Intervertebral Disc. B. Woodhall and G. J. Hayes.—p. 786.
Sympathetic Ganglionectomy and Limb Length in Poliomyelitis. J. S. Barr, A. J. Stinchfield and J. A. Reidy.—p. 793.
Longitudinal Growth of Human Vertebra: Contribution to Human Osteogeny. E. M. Bick and J. W. Copel.—p. 803.
Granuloma Resulting from Use of Talc in Orthopaedic Surgery. J. A. Key and R. H. Ramsey.—p. 815.
Embryological Development of Tendinous Apparatus of Fingers: Relation to Function. E. B. Kaplan.—p. 820.
Club-Foot: Embryological Study of Associated Muscle Abnormalities. C. O. Bechtol and H. W. Mossman.—p. 827.
Spurs of Calcaneus in Strümpell-Marie Disease: Report of 15 Cases. J. B. Davis and H. C. Blair.—p. 838.
Further Experience in Management of Osteitis Condensans Ilii. F. L. Shipp and G. E. Haggart.—p. 841.
*Marie-Strümpell Arthritis: Follow-Up Study of Roentgenographic, Physical, and Orthopaedic Therapy. L. D. Baker, R. W. Coonrad, R. J. Reeves and W. A. Hoyt Jr.—p. 848.
Study of Gross Anatomy of Arteries Supplying Proximal Portion of Femur and Acetabulum. W. W. Howe Jr., T. Lacey II and R. P. Schwartz.—p. 856.
Vascular Foramina and Arterial Supply of Distal End of Femur. W. M. Rogers and H. Gladstone.—p. 867.
Tenotomy in Treatment of Spastic Paraplegia: With Special Reference to Tenotomy of Iliopsoas. L. T. Peterson.—p. 875.
Arthrodesis of Hip for Instability and Pain in Poliomyelitis. H. Hallock. —p. 904.

Well-Leg-Raising Test in Ruptured Intervertebral Disk.—The well-leg-raising test is a useful adjunct to the Lasègue, or straight-leg-raising, test in the clinical diagnosis of ruptured lumbar intervertebral disk. Both tests are performed with the patient supine. In the Lasègue test, elevation of the involved extremity with the knee extended produces pain at the sciatic notch on that side. In the well-leg-raising test, elevation of the uninvolved extremity produces pain in the involved hip or thigh. The pain in both cases is due to stretching of the spinal nerve roots across the protruded disk, rather than to muscle spasm. This was confirmed by the authors, who found in the

cadaver and in patients undergoing surgical intervention that straight-leg-raising stretches the fourth and fifth lumbar and first sacral nerve roots on that side in a caudal and ventral direction, while it stretches those on the opposite side in a rostral and ventral direction. In either case this would compress the roots across any protruding disk. In a study of 293 patients with verified ruptured intervertebral disk, the authors found that 95 (32 per cent) had a positive well-leg-raising test, and all of these had unusually large protrusions. In the cases studied, the protrusion was located medial to the nerve or below it. Five additional patients had positive reactions without a disk lesion at operation. Two of these had adhesions of the nerve roots to the spinal canal; one had a questionable protrusion, and the other two had no demonstrable pathological lesion.

Marie-Strümpell Arthritis: Roentgen Therapy.—Baker and associates studied the late results of combined roentgen and orthopedic therapy in 100 patients with arthritis of the spine. Roentgen treatment was given in doses of 150 r (200 kv.) to areas 5 by 15 cm. in diameter over the spine, and this was supplemented by physical therapy, active exercise, vocational therapy and braces. Four years or more later all patients were reexamined. Pain had been relieved in 74 per cent in all stages of the disease. The range of motion of the spine was increased in 45 per cent of the mild and moderately advanced cases and in 37 per cent of the advanced cases. Roentgenographic changes in the spine improved in 33 per cent of the mild and moderately advanced cases and in 22 per cent of the advanced cases. In some of the milder cases, the process was arrested or cleared entirely. In other patients the disease progressed in spite of relief of pain. There was no correlation between amount of roentgen therapy given and benefit obtained, and there has been no satisfactory explanation of the effect of roentgenotherapy in this disease. The authors point out that typical rheumatoid arthritis does not respond to roentgen therapy and suggest that it may be inaccurate to classify Marie-Strümpell arthritis as a form of rheumatoid arthritis.

Journal of Lab. and Clinical Medicine, St. Louis

36:675-848 (Nov.) 1950

Experimental Production of Nutritional Macrocytic Anemia in Swine: III. Further Studies on Pteroylglutamic Acid Deficiency. G. E. Cartwright, J. G. Palmer, B. Tatting and others.—p. 675.
Further Investigation on Effect of Vitamin B_{12} Concentrate upon Hepatic Injury Produced by Carbon Tetrachloride. D. Koch-Weser, P. B. Szanto, E. Faber and H. Popper.—p. 694.
Studies of Liver Function Tests: I. Combined Intravenous Bromsulfalein-Hippuric Acid-Galactose Test. L. Zieve, E. Hill and S. Nesbitt. —p. 705.
Observations on Influence of Intravenous Histamine on Qualitative Platelet Activity in Coagulation. S. Butler, F. R. Hall and H. N. Sanford.—p. 710.
*Serum Potassium in Uremia: Report of 16 Cases, Some with Paralysis. W. J. Kolff.—p. 719.
Renin Sensitivity and Renin Substrate Levels in Adrenalectomized Dogs. W. D. Davis Jr., A. Segaloff, W. S. Jacobs and J. B. Callahan. —p. 729.
Amino Acid in Plasma and Urine of Patients with Hepatitis Before and After Single Infusion of Protein Hydrolysate. J. B. Kirsner, A. L. Sheffner, W. L. Palmer and O. Bergeim.—p. 735.
Laboratory Observations on Actions of Aureomycin, Circulin, Polymyxins B, D, and E on Endamoeba Histolytica. J. Y. C. Watt and W. B. VandeGrift.—p. 741.
*Treatment of Various Infections with Terramycin. E. R. Caldwell Jr., H. W. Spies, C. K. Wolfe and others.—p. 747.
Human Infection with Virus of Vesicular Stomatitis. R. P. Hanson, A. F. Rasmussen Jr., C. A. Brandly and J. W. Brown.—p. 754.
Two-Hour Versus Three-Hour Administration of Crystalline Penicillin G: Treatment of Early Syphilis. H. N. Bundesen, J. Rodriques and G. X. Schwemlein.—p. 759.

Serum Potassium in Uremia.—Kolff studied 16 patients with uremia, some with low and some with high serum potassium levels. The normal values of serum potassium vary between 16 and 22 mg. (4 to 5.5 milliequivalents per liter). The subnormal serum potassium values observed in nine patients varied from 1 to 4 milliequivalents per liter. Three of these nine patients had muscular weakness and paralysis of the extremities. The paralysis was not closely correlated with any critical potassium level. For control of the uremia, eight of the nine patients were placed on a forced high caloric, low protein diet, according to the Borst principle. After ingestion of carbohydrates, a movement of potassium from the extracellular to the intracellular space takes place. Thus the lowering of serum potassium is explained. The lowest potassium levels and the paralysis were seen in patients placed on a strict butter and sugar diet. A maintenance dose of 2 or 3 Gm. of potassium chloride or of potassium bicarbonate should be added to this diet, according to potassium determinations. Two of the patients with subnormal serum potassium levels had at other times abnormally high levels. One of them had paralysis due to increased potassium concentration and died. Beside these two patients, there were seven who had serum potassium values higher than 35 mg. per 100 milliliters (9 milliequivalents per liter). Four died from potassium intoxication, one with paralysis indistinguishable from that caused by potassium deficiency. One patient was improved by being placed on the Borst diet. The potassium level was lowered with the artificial kidney in one patient, who recovered. Two patients were treated successfully with peritoneal dialysis, but death occurred from the underlying disease in one patient after 14 days and in the other after four months. One patient was given 900 milliliters of 40 per cent dextrose solution with insulin intravenously. Although death occurred from preexisting pulmonary complications, the serum potassium was reduced from 9.5 to 5.5 milliequivalents per liter, despite almost complete anuria.

Terramycin in Various Infections.—Caldwell and co-workers used terramycin hydrochloride in the treatment of 171 patients with various infections. The dose used in most adult patients was 2.0 Gm. initially, followed by 0.5 Gm. every four hours. Children were given 50 mg. per kilogram of body weight per day. One adult patient received 0.5 Gm. every six hours, and three were given 1 Gm. every four hours. Treatment usually was continued until the temperature was normal for 48 hours or, in urinary tract infections, until the infecting organism could no longer be obtained on culture. Terramycin hydrochloride was effective in the treatment of pneumococcic pneumonia, streptococcic sore throat and pneumonia, scarlet fever, gonorrhea, Shigella dysentery and some urinary tract infections with gram-negative rods. The drug was ineffective in mumps and measles. Further studies are needed to determine its usefulness in other diseases. Twenty-five per cent of the patients complained of one or more gastrointestinal symptoms, although discontinuance of the antibiotic was required in only seven instances, because of vomiting. One patient complained of transient vertigo.

Journal-Lancet, Minneapolis

70:411-452 (Nov.) 1950

The Surgeon's Approach to Problem of Alimentary Tract Malignancy. O. H. Wangensteen.—p. 411.
Significance of Tumors of Neck. C. W. Mayo and M. J. Lee Jr.—p. 420.
Present Status of Surgery in Treatment of Hyperthyroidism. E. S. Judd Jr.——p. 429.
Suppurative Diseases of Lungs—Advances in Surgical Management. G. A. Dodds.—p. 433.
Use of Anesthesia in General Practice. J. S. Lundy.—p. 435.
Polypoid Adenomas of Rectum and Colon in Children. G. H. Hall. —p. 440.
Brief Account of Evolution of Antiseptic Surgery. L. F. Peltier.—p. 442.

Journal of Nervous and Mental Disease, New York

112:375-468 (Nov.) 1950

Insulin Coma Treatment of Schizophrenia Compared with Electric Coma Treatment of Patients on Sub-Shock Insulin. W. L. Holt Jr., D. Landau and T. Vernon.—p. 375.
Effects of Direct Interrupted Electroshock on Experimental Neuroses. J. H. Masserman, A. Arieff, C. Pechtel and H. Klehr.—p. 384.
Experiences with Antabuse Treatment of Alcoholism in General Hospital. A. E. Bennett, L. G. McKeever and R. E. Turk.—p. 393.
Cytologic Changes in Cells of Thalamic Nuclei in Senile, Paranoid and Manic Psychoses: Significance of Dorsal Thalamus in Psychoses. J. W. Papez and J. F. Bateman.—p. 401.
Thyroid Function in Mental Disease: Multiple Test Survey. K. M. Bowman, E. R. Miller, M. E. Dailey and others.—p. 404.
Report on Current Status of Attempt to Correlate Abnormality of Distribution of One Brain Enzyme with Mental Dysfunction. W. Ashby. —p. 425.

Journal of Neurosurgery, Springfield, Ill.

7:467-598 (Nov.) 1950

Carotid-Internal Jugular Anastomosis in Rhesus Monkey: Angiographic and Gasometric Studies. E. S. Gurdjian, J. E. Webster and F. A. Martin.—p. 467.
Geniculate Neuralgia: Report of Case Relieved by Intracranial Section of Nerve of Wrisberg. A. A. Wilson.—p. 473.
Vagus Nerve in Surgical Consideration of Glossopharyngeal Neuralgia. J. T. Robson and J. Bonica.—p. 482.
*Epidural Granulomata in Presence of Tantalum Plates. A. M. Meirowsky, L. A. Hazouri and D. J. Greiner.—p. 485.
Use of Pure Polyethylene Plate for Cranioplasty. E. Alexander Jr. and P. H. Dillard.—p. 492.
*Tractotomy for Relief of Trigeminal Neuralgia: Observations in 124 Cases. B. Guidetti.—p. 499.
*Roentgen Therapy Supplementing Surgery in Treatment of Gliomas. G. M. Tice and N. W. Irving.—p. 509.
Gliomas of Neurohypophysis and Hypophysial Stalk: Preliminary Report. N. Antoni.—p. 521.
Ligation of Internal Carotid Artery in Neck: Prevention of Certain Complications. J. L. Poppen.—p. 532.
Divergence Paralysis with Increased Intracranial Pressure. M. Chamlin and L. M. Davidoff.—p. 539.
Unusual Congenital Anomalies of Neurosurgical Interest in Infants and Children. E. A. Kahn and L. J. Lemmen.—p. 544.
Tumors of Occipital Lobe. D. Parkinson, W. M. Craig and J. W. Kernohan.—p. 555.
Application of Neuroanatomical Data to Diagnosis of Selected Neurosurgical and Neurological Cases. E. C. Crosby.—p. 566.

Granulomas in Presence of Tantalum Plates.—Meirowsky and his co-workers feel that although tantalum plates are suited for cranial repair because they are malleable and nontoxic, complications may result from their use. They report 11 cases in which removal of a tantalum plate was necessitated by the formation of a large infected epidural granuloma, symptoms of which appeared from one week to 33 months after insertion of the plate. The skin had broken down over the plate in eight patients at the time of admission to hospital. The remaining three patients had fluctuant swelling, redness and tenderness over the site of the plate. An infected granuloma was found in 10 cases. In one case an epidural abscess was encountered without a fully developed granuloma but with granulomatous tissue surrounding the plate. In four patients the granuloma was covered by an abscess. Cranioplasty had been performed in the presence of actual or potential infection in all these patients. Even though a metal may be noncytotoxic, it is still a foreign body that is often poorly tolerated by tissues harboring infectious organisms. The authors, in agreement with Holbrook, who observed granuloma formation with acrylic plates, do not believe that the granulomas they have described are specifically related to tantalum but feel that the granuloma represents a general foreign body reaction of infected tissue. Repair with tantalum plates of cranial defects should not be undertaken as long as infection is present. In the presence of potential infection, approximately 12 asymptomatic months should elapse before tantalum repair is attempted. Only large defects endangering the underlying structures should be plated. The need for perforations in tantalum plates is suggested by the fact that in nine of the 11 cases the plates were solid, and with perforated plates granuloma can certainly be recognized more easily.

Tractotomy for Trigeminal Neuralgia.—Guidetti states that one of the chief objections to section of the fifth cranial nerve is the resulting total loss of sensation in the trigeminal area. In some instances the operation has resulted in painful paresthesia in the anesthetic area. To eliminate these complications, Sjöqvist in 1937 performed the first operative sectioning of the descending tract of the trigeminal nerve in the medulla oblongata and obtained a dissociated anesthesia. Since 1937 approximately 284 cases of tractotomy for various neuralgic syndromes have been reported from several clinics. The author reviews 124 cases in which tractotomy was performed at Olivecrona's clinic in Stockholm. In 40 patients the trigeminal tract was sectioned at a level corresponding to the border between the middle and the inferior third of the olivary eminence, and in 84 it was performed at a level corresponding to the lower end of the fourth ventricle. This modification has practically eliminated the danger of laryngeal palsy and disturbances of gait and station. Because trigeminal tractotomy is potentially more dangerous than section of the sensory fibers by the subtemporal approach and because it is followed by a relatively great number of recurrences, it cannot be used as a routine measure. It is indicated in persons in whom preservation of the tactile sensation in the face is desirable, and in whom, in case of a recurrence, a secondary operation can be performed without risk to life. Tractotomy is thus indicated in young and middle-aged persons in good general health and with moderate neuralgia, especially if the neuralgia is localized to the ophthalmic and maxillary divisions.

Roentgen and Surgical Therapy for Gliomas.—Improvement after operation for brain tumor may be due to the removal of a large part of the tumor or to the decompression incidental to the surgical intervention. During the 16 years prior to Jan. 1, 1949, 52 patients with brain tumors were treated with roentgen therapy. Of this number, 15 are living. The astroblastoma group shows an average survival rate of 46.4 months, with 30 per cent alive for five years. The cellular meningioma and hemangioblastoma group is too small to justify conclusion; one out of five is alive for five years. The glioblastoma, spongioblastoma and oligodendroglioma show no five year cures; there is an average survival of 16 months. The medulloblastoma series, consisting of 16 cases, shows a 21.3 months average survival, no patient living for five years. There is evidence that irradiation of the brain of animals and men may produce degenerative changes in the normal brain. A dose should be used that will cause maximum regression of the tumor with the least amount of damage to normal brain tissue. There is a justified tendency toward a higher dose. The patients who survived received an average dose of 5,900 r to the tumor. The literature indicates that from 5,000 r to 6,000 r is the generally accepted total tumor dose in from 20 to 30 treatments.

Journal Pharmacology & Exper. Therap., Baltimore

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Reversal of Depressor Action of N-Isopropylarterenol (Isuprel) by Ergotamine and Ergotoxine. A. M. Lands, F. P. Luduena, J. I. Grant and others.—p. 284.
Theophylline Blood Levels After Oral, Rectal and Intravenous Administration, and Correlation with Diuretic Action. E. B. fruitt Jr., V. A. McKusick and J. C. Krantz Jr.—p. 309.
Effect of 2,2-Diethyl 1,3-Propanediol (New Anticonvulsant) on Spinal Cord Reflexes. I. H. Slater, J. F. O'Leary and D. E. Leary.—p. 316.
Pharmacological Investigation of 2,5-Bis-(3-Diethylaminopropylamino) Benzoquinone-Bis-Benzylchloride (Win 2747): New Curarimimetic Drug. J. O. Hoppe.—p. 333.
Digitalis-Like Action of Cryptograndoside A and B. K. K. Chen, R. C. Anderson and F. G. Henderson.—p. 346.
Experimental Study of Cocaine Intoxication and Its Treatment. J. E. Steinhaus and A. L. Tatum.—p. 351.
Evaluation of Curarizing Drugs in Man: V. Antagonism to Curarizing Effects of d-Tubocurarine by Neostigmine, m-Hydroxy Phenyltrimethylammonium and m-Hydroxy Phenylethyldimethylammonium. D. W. Macfarlane, E. W. Pelikan and K. R. Unna.—p. 382.

Kentucky Medical Journal, Bowling Green

48:499-540 (Nov.) 1950

Surgical Aspects of Scout Films of Abdomen. C. M. Bernhard.—p. 499.
Medical Problems of Older People. H. Harrison.—p. 505.
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Controversial Points in Management of Tumors of Bone. B. L. Coley.—p. 511.
Painful Upper Abdomen. J. B. Floyd Jr.—p. 515.

Michigan State Medical Society Journal, Lansing

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American Medicine Looks Ahead. E. L. Henderson.—p. 1281.
President's Address. W. E. Barstow.—p. 1285.
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Psychiatry and Driver: All Types of Vehicles—Land, Sea and Air. J. A. Larson.—p. 1288.
Impressions of Gout. F. Bramigk.—p. 1297.
Does Uterine Myoma Always Mean Operation? W. F. Mengert.—p. 1302.
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New England Journal of Medicine, Boston

243:723-762 (Nov. 9) 1950

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Some Contributions of Anesthesiology to General Practice of Medicine. E. M. Papper.—p. 734.
Subacute Bacterial Endocarditis Caused by Gaffkya Tetragena: Report of Case. R. D. Boynton.—p. 738.
Evaluation of Cardioactive Agents by Human Bioassay. S. J. Shane. —p. 740.

Pediatrics, Springfield, Ill.

6:557-686 (Oct.) 1950

Effect of Patent Ductus Arteriosus on Pulmonary Blood Flow, Blood Volume, Heart Rate, Blood Pressure, Arterial Blood Gases and *pn*. D. E. Caseels, M. Morse and W. E. Adams.—p. 557.
Situs Inversus, Bronchiectasis and Sinusitis: Report of Family with Two Cases of Kartagener's Triad and Two Additional Cases of Bronchiectasis Among Six Siblings. W. H. Bergstrom, C. D. Cook, J. Scannell and W. Berenberg.—p. 573.
*Poliomyelitis: Six Year Study of Cases at Children's Hospital, San Francisco. H. E. Thelander, M. Sehring and E. B. Shaw.—p. 581.
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*Glycogen Storage Disease of Heart: II. Critical Review of Literature. P. A. di Sant'Agnese, D. H. Andersen and H. H. Mason.—p. 607.
Anesthetic Management of Infants and Children During Endoscopy. M. Helrich, J. F. Daly and E. A. Rovenstine.—p. 625.
Erythroblastosis Fetalis: III. Prognosis in Relation to Clinical and Serologic Manifestations at Birth. L. K. Diamond, V. C. Vaughan III and F. H. Allen Jr.—p. 630.
Candida Krusei as Pathogen: Case Report of Unusual Infection of Tonsils. G. D. Rock and D. Brand.—p. 638.
Absorption of Fat and Vitamin A in Premature Infants: II. Effect of Particle Size on Absorption of These Substances. S. Morales, A. W. Chung, J. M. Lewis and others.—p. 644.

Poliomyelitis.—Thelander and her associates cite a previous report in which they reported clinical observations on poliomyelitis cases from the Children's Hospital in San Francisco over the six year period 1943-1949. They discuss the sources and sampling of the case material and analyze some specific observations. This series of 453 cases does not present a valid cross section of cases. Patients from San Francisco are usually admitted early or when the disease is suspected. Thus, these cases include all degrees of severity. The nonlocal cases, however, represent somewhat severer cases, including more difficult problems in diagnosis and those requiring special methods of treatment, such as artificial respiration, tracheotomy and care of circulatory failure and urinary retention. Age, economic status and the high proportion of females are other factors in which this material differs somewhat from a truly representative cross section of poliomyelitis cases. Sore throat, tonsillitis and gastroenteritis have been considered by many observers as symptoms of invasion by the poliomyelitis virus. The authors challenge this concept and suggest that a far more likely hypothesis is that other infections may serve to convert latent and inapparent infection into obvious disease of the central nervous system. Many authorities include these evidences of preliminary infection as the initial component of biphasic (dromedary) poliomyelitis. This concept appears especially inapplicable to those instances in which preliminary disease differs sharply in symptomatology from that usually characterizing invasion of the central nervous system. There is much evidence that the poliomyelitis virus is widely distributed during epidemics and that the virus may frequently produce inapparent and completely latent infection, which may be converted into active disease by a variety of factors, including unrelated infections, which increase the susceptibility of the central nervous system of the host. The value of pooled irradiated human plasma in therapy is not great, but statistically this is almost impossible to prove because a weakly effective agent is applied in the treatment of an infection that has an extremely variable outcome. Although nonparalytic poliomyelitis is believed to be frequent, the authors believe that if diagnosis is restricted to cases with definite clinical and laboratory observations, only a small proportion will completely escape paralysis, though this paralysis may be minimal and may disappear before the end of the two week period of hospitalization.

Glycogen Storage Disease of the Heart.—According to di Sant' Agnese and his associates, a total of 14 cases of glycogen storage disease of the heart have been reported. This number includes two cases observed by them and described in a previous paper. It is a rare disease of early infancy resulting in death a few weeks or months after birth. The condition is characterized by signs of heart failure and by a greatly enlarged heart, which is found even more consistently on roentgen than on physical examination. On the basis of the meager genetic information available, the condition may be provisionally classed as a hereditary error of metabolism. Storage disease of the heart is incompatible with life for more than a few months, during which cardiac function continuously deteriorates. The most plausible explanation is that of death caused mechanically by accumulation of glycogen in the myocardial fibers so that their contraction is impeded and effective cardiac action no longer possible. Because glycogen is abnormally accumulated in other parts of the body, the term "glycogen storage disease of the heart" is obviously a misnomer. The synonyms "cardiac type of glycogen storage disease" and "cardiomegalia glycogenica diffusa" can also be used. The name Von Gierke's disease of the heart leads to confusion with the hepatic type of glycogen storage disease, an entirely different pathological entity. The clinical and metabolic differences between the hepatic and cardiac types of glycogen storage disease are presented. Other conditions characterized by abnormally great accumulation of glycogen in the myocardium, such as congenital rhabdomyoma of the heart, so-called cardiomegalia glycogenica circumscripta and occasional cases in which death is sudden though not always explained, are described and their differentiation discussed. There are no pathognomonic signs or laboratory investigations for glycogen storage disease of the heart, except for the histochemical demonstration of abnormal amounts of glycogen in the skeletal muscles. It is suggested that biopsy of skeletal muscle be performed in all cases in which unexplained enlargement of the heart occurs in infancy. This is essential for planning of antemortem and postmortem pathological and chemical studies.

6:687-826 (Nov.) 1950

Remodeling Medical Education. J. M. Mitchell.—p. 687.
*Possibilities of Specific Prevention and Treatment of Poliomyelitis. W. M. Hammon.—p. 696.
Erythroblastosis Fetalis: IV. Further Observations on Kernicterus. V. C. Vaughan III, F. H. Allen Jr. and L. K. Diamond.—p. 706.
Blood Carbonic Anhydrase Activity in Newborn Infants and Their Mothers. M. D. Altschule and C. A. Smith.—p. 717.
Congenital Deficiency of Abdominal Musculature with Associated Genitourinary Abnormalities: Syndrome: Report of Nine Cases. J. F. Eagle Jr. and G. S. Barrett.—p. 721.
Total Blood Eosinophil Counts in Newborn Period. H. S. Medoff and G. J. Barbero.—p. 737.
Albumin Therapy in Nephrosis. E. Galan, O. García, M. Perez Estable and others.—p. 743.
Studies of Acid Base Equilibrium in Premature Infants. H. S. Reardon, B. D. Graham, J. L. Wilson and others.—p. 753.
Study of Influence of Sex of Donor on Survival of Erythroblastotic Infants Treated by Exchange Transfusion. M. S. Sacks, C. L. Spurling, I. D. J. Bross and E. F. Jahn.—p. 772.

Prevention and Treatment of Poliomyelitis.—Hammon discusses the possibilities of passive immunization against poliomyelitis. He feels that this offers practical and theoretical advantages over active immunization. A vaccine for all immunologic types is not available and may never be available in adequate quantities or at a reasonable cost. Furthermore, if an inactivated vaccine is used, annual revaccination for duration of life might be required. The effectiveness of serum prophylaxis has been demonstrated in animals and has been given field trials in man, but the results are inconclusive. Gamma globulin from adults should contain antibody to all prevalent types and has been shown to be active in monkeys against three types of the disease. It has been used on a small scale in man as a prophylactic agent but not on an experimental basis. Gamma globulin, judging from epidemiological reasoning and experimental evidence, which is now inadequate, would not be

expected to prevent infection, but should prevent clinical disease. If this proves to be true, it would permit the development of permanent immunity through inapparent infection, a decided practical advantage. Its use would be recommended only during epidemic years and for only the more susceptible age groups. Since gamma globulin is now available, a carefully controlled field experiment should be done to determine its effectiveness. Once infection has occurred, there is no evidence that serum, gamma globulin or other immunologic agent has any therapeutic or abortive effect. So far, no practical therapeutic or prophylactic antibiotic or chemotherapeutic agent has been developed against poliomyelitis; however, advances in this field lead to optimism.

Plastic and Reconstructive Surgery, Baltimore

6:345-412 (Nov.) 1950

Preliminary Report on Development of Neuro-Muscular Junctions in Cases of Facial Paralysis Followed by Masseter Muscle Transplantations. N. Owens.—p. 345.
Experimental and Clinical Study of Histopathology and Pathogenesis of Graduated Thermal Burns in Man and Their Clinical Implication. M. A. Entin and H. Baxter.—p. 352.
Total Helix Reconstruction with Tubed Pedicles Following Loss by Burns. J. W. McNichol.—p. 373.
Bleeding Nipple, and Operation for Pendulous Breast. H. Koechlin. —p. 387.
Use of Composite Tube Pedicle in Reconstruction of Breast Defect with Subsequent Cosmetic Repair of Donor Breast. H. G. Yannilos. —p. 396.
Neo-Areoloplasty with Labial Transplant. Symmetrical Correction of Shape and Volume of Breast. V. Spina.—p. 400.
New Method for Correction of Stenosis Following Esophagoplasty. D. Lázár.—p. 403.

Postgraduate Medicine, Minneapolis

8:345-438 (Nov.) 1950

Electrocardiogram in Potassium Disturbance. K. K. Lewin and L. H. Criep.—p. 345.
Surgical Treatment of Duodenal Ulcer. L. T. Palumbo, R. E. Paul, M. Leibovitz and H. J. Fishman.—p. 352.
Hysterosalpingography: Its Dangers and Their Prevention. J. L. Royals, C. N. Price and P. Titus.—p. 363.
Diverticulitis of Colon. C. W. Mayo.—p. 368.
Commissurotomy for Mitral Stenosis. C. P. Bailey, R. P. Glover and T. J. O'Neill.—p. 374.
Surgical Treatment of Ulcerative Colitis. L. K. Ferguson.—p. 384.

Proc. Staff Meet. Mayo Clinic, Rochester, Minn.

25:585-600 (Oct. 11) 1950

*Surgical Aspects of Mesenteric Vascular Occlusion. W. D. Seybold and J. E. Musgrove.—p. 585.
Report on Radium Therapy for 1949. R. E. Fricke and M. Van Herik. —p. 591.
Use of Phenurone for Convulsive Disorders of Children: Preliminary Report. H. M. Keith.—p. 594.
Papillomas of Larynx, Trachea and Bronchi: Report of Case. D. K. Buffmire, O. T. Clagett and J. R. McDonald.—p. 595.

Mesenteric Vascular Occlusion.—A review of the records of 24 cases of mesenteric vascular occlusion that were observed at the Mayo Clinic in the period 1938-1948 suggest, according to Seybold and Musgrove, that the outlook for patients with this disease has greatly improved. The acute occlusive process is usually a thrombosis involving the superior mesenteric artery or vein. Commonly, some generalized vascular disease, a hematological lesion, such as blood dyscrasia, splenic anemia or polycythemia vera, an intra-abdominal infection or trauma to the superior mesenteric vessels at the time of operation or during the incarceration of a hernia provides the underlying or precipitating factor in the development of mesenteric vascular occlusion. Midabdominal pain is usually the first complaint. Early in the attack the meager signs that are elicitable on physical examination may be difficult to reconcile with a serious surgical lesion, but as ischemia or congestion of the bowel is succeeded by necrosis and gangrene, signs reflecting these changes develop. With the use of gastrointestinal suction, of parenteral administration of fluids and electrolytes to correct depletion of water and salt and of whole blood to relieve shock and anemia, the general condition of many of these patients can be so improved that intestinal resection, the only treatment that offers a reasonable prospect of survival, can be safely carried out. There was only one death among the 10 patients who underwent bowel resection. The 11 who did not undergo exploration and the three who underwent exploration only all died. The preoperative supportive measures must be continued through the early postoperative period. The use of antibiotics and anticoagulants is recommended in addition.

Public Health Reports, Washington, D. C.

65:1419-1460 (Nov. 3) 1950

Controlled Investigation of Streptomycin Treatment in Pulmonary Tuberculosis. E. R. Long and S. H. Ferebee.—p. 1421.

65:1461-1492 (Nov. 10) 1950

Hospital Beds in the United States, 1950. J. W. Cronin, L. S. Reed and A. M. Baney.—p. 1461.
Alkalescens-Dispar Group. W. H. Ewing, M. W. Taylor and M. C. Hucks.—p. 1474.
Laboratory Tests on Rapidity of Molluscacidal Action of Copper Sulfate in High Concentration. M. O. Nolan.—p. 1481.

65:1493-1536 (Nov. 17) 1950

HEALTH RESOURCES IN DEFENSE OF THE NATION

Civil Defense. L. A. Scheele and others.—p. 1495.
Personnel Adjustment. L. A. Scheele and others.—p. 1505.
Current Problems. O. R. Ewing.—p. 1509.
Scientific Developments. K. Habel, C. Powell, J. Cronin and others. —p. 1515.
Health and the Child. K. F. Lenroot.—p. 1525.

Radiology, Syracuse, N. Y.

55:641-800 (Nov.) 1950. **Partial Index**

Primary Reticulum-Cell Sarcoma of Bone: Summary of 37 Cases. B. L. Coley, N. L. Higinbotham and H. P. Groesbeck.—p. 641.
Significance of Intracranial Calcification in Roentgenologic Diagnosis of Intracranial Neoplasms. J. D. Camp.—p. 659.
*Pulmonary Adenomatosis: Report of Four Cases. J. C. King and D. S. Carroll.—p. 669.
Pulmonary Adenomatosis: Further Roentgen Observations. L. W. Paul and J. H. Juhl.—p. 681.
*Hamartoma of Lung. Improbability of Preoperative Diagnosis. W. E. Lemon and C. A. Good.—p. 692.
Surgical Experience with Asymptomatic Intrathoracic Growths. S. O. Freedlander, S. Wolpaw and H. J. Mendelsohn.—p. 700.
The Pathologist's Approach to Pulmonary Neoplasms. A. R. Moritz. —p. 712.
Aberrant Pancreatic Tissue in First Portion of Duodenum. M. Littner. —p. 716.
Value of Hysterography in Diagnosis of Large Submucous Uterine Fibroids. R. H. Marshak, M. A. Goldberger and W. A. Epstein. —p. 725.
Bilateral Fracture of Humeral Heads: Case with Fractures of Anatomical and Surgical Necks of Humeri Due to Convulsion. G. Mackmull and S. D. Weeder.—p. 736.
Priodax and Pseudoalbuminuria. E. E. Seedorf, W. N. Powell, R. G. Greenlee and J. T. Hartman.—p. 740.
Dosage Units for High-Energy Radiation. U. Fano and L. S. Taylor. —p. 743.
Nomogram for Dose Determinations in Diagnostic Roentgenology. J. Sorrentino and R. Yalow.—p. 748.

Pulmonary Adenomatosis.—King and Carroll report the occurrence of benign pulmonary adenomatosis in four women between the ages of 50 and 63. This is a rare disease of unknown etiology, characterized by a remarkable proliferation of alveolar lining cells throughout large areas of the lungs, by an absence of invasive characteristics or regional or distant metastases. The symptoms are progressive dyspnea, cough productive of copious amounts of thin mucoid sputum, weakness and weight loss. The disease runs an afebrile, gradually downhill course. The duration of symptoms is from a few months to two or three years, the average being about one year. All four patients died as the result of asphyxia and terminal pneumonia. Two roentgenographic patterns were observed. In the first type, there were innumerable, widespread, discrete and confluent nodular densities, poorly outlined and having no hilar adenopathy. In the second type, there were homogeneous densities resembling areas of pneumonic consolidation. Serial films showed only slow progression of the disease. One case was particularly interesting because the correct diagnosis was made before death from evaluation

of the clinical and radiographic features. It is the first case in which the diagnosis was confirmed before death by aspiration biopsy.

Hamartoma of Lung.—Lemon and Good studied the microscopic sections and roentgenograms in 17 cases of hamartoma of the lung removed surgically in the past six years. Eleven of the patients were men, and six were women. The range in age was from 21 to 62 years. Thirteen of the tumors occurred on the right and four on the left side. Seven lay close to fissures or were subpleural. In 15 of the cases the tumors contained cartilage and some of the other characteristic tissues: epithelium, smooth muscle, fat, bone, lymphocytes and connective tissue. Diagnosis even by examination of tissue was difficult in two of the cases. Symptoms did not aid in diagnosis. In only five cases was a diagnosis of hamartoma suggested by the roentgenographic observations. It is unlikely that bronchoscopy would have been of diagnostic value, nor would cytological examination of sputum have excluded the possibility of carcinoma. The authors found no diagnostic alternative to exploratory thoracotomy in this study. Their experience accorded generally with that of others, except that roentgenographic observations were found to be less characteristic than some other investigators have considered them to be. Of the 17 lesions, 11 gave either no roentgen evidence of calcification or insufficient evidence of calcification.

South Carolina Medical Assn. Journal, Florence

46:337-372 (Nov.) 1950

Neurosurgical Problems of Infancy. B. Woodhall.—p. 337.
Treatment of Diabetes in Children. G. D. Johnson and S. E. Elmore. —p. 339.
Diagnosis and Clinical Significance of Iron Deficiency Anemia. D. C. Mitchell and O. B. Mayer.—p. 343.
Rectal Bleeding. C. A. West.—p. 347.
Carcinoma of Cervix. J. M. Wilson and J. R. Sosnowski.—p. 349.

Southern Medical Journal, Birmingham, Ala.

43:921-1006 (Nov.) 1950

*Studies on Pattern of Potassium and Other Electrolytes of Gastric Juices During Secretion; Effect of Prolonged Loss of Stomach Juices on Body Potassium. L. Martin.—p. 921.
Solitary Bone Cyst. M. J. Stewart and H. A. Hamel.—p. 927.
Unusual Reaction to Glyceryl Trinitrate. S. M. Jacobson.—p. 936.
Lamellar Transplantation. R. Townley Paton.—p. 939.
Sight Conservation in Industry: Program for Elimination of Eye Hazards. E. W. Griffey.—p. 940.
Lingual Thyroid: Use of Radioactive Iodine, I^{131}, in Diagnosis and Treatment. K. R. Crispell and W. Parson.—p. 945.
Circulating Red Cell Mass in Polycythemia Vera as Determined by Red Blood Cells Tagged With Radioactive Isotope of Iron. P. F. Hahn, E. B. Wells and G. R. Meneely.—p. 947.
Urticaria Associated With Cerebral Edema. T. W. Murrell and T. W. Murrell Jr.—p. 950.
Investigation of Autonomic Responses in Psychopathic Personalities. C. J. Ruilmann and M. J. Gulo.—p. 953.
First Year of Regional Education. W. J. McGlothlin.—p. 956.
The Physician, the Patient and Vocational Rehabilitation. H. Notkin. —p. 960.
Cervical Pregnancy. O. A. Ellingson.—p. 962.
Carcinoma of the Cervix Complicating Pregnancy. S. V. Ward and T. B. Sellers.—p. 964.

Potassium in Gastric Juices.—Martin studied the concentration of potassium in the mucoid, achlorhydric and hydrochloric acid portions of gastric juice and in saliva from 35 patients. Potassium was present in each specimen of gastric juice. The concentration of the ion in salivary and gastric mucus, achlorhydric and hydrochloric acid secretions was several times higher than in serum. The concentrations of potassium in gastric juices obtained from five patients who had undergone vagotomy were approximately equal to those noted in achlorhydric gastric secretions. During the active phase of acid gastric secretion, an increased concentration of potassium was observed in the majority of the patients. It returned to prestimulation levels, or below them, as the stimulus waned. The concentration of potassium exceeded that of sodium in some gastric juices with high titrimetric hydrochloric acid values. Low sodium dietary intake, of a month's duration, was not associated with a change in the concentration of sodium or potassium ions in gastric secretions. The demonstration of potassium ion in gastric secretions suggests that its presence is a function of gastric gland activity. The continued or increased concentrations of potassium, in association with increasing acidity and diminishing concentrations of sodium and nitrogen, suggest that potassium may be secreted with hydrochloric acid as a result of parietal gland activity.

Texas State Journal of Medicine, Fort Worth

46:731-796 (Oct.) 1950

Some Advances in Obstetrics in Past Decade. A. T. Stewart.—p. 734.
Observations on Pathology of Spontaneous Abortion: Preliminary Report of 500 Cases. C. T. Javert and W. F. Finn.—p. 739.
Conservative Surgery in Gynecology. R. J. Crossen.—p. 746.
Analysis of Cesarean Sections in Private Hospital From 1938 to 1948. E. W. Santa Cruz and S. F. Moore Jr.—p. 751.
Functional Uterine Bleeding. J. W. Vieaux.—p. 754.
Harris County Maternal Mortality Committee: Organization, Aims, and Results. A. L. Dippel.—p. 758.
Glucose Tolerance Tests: Relative Validity of Four Different Types of Tests. J. H. Moyer and C. R. Womack.—p. 763.
Intercapillary Glomerulosclerosis: Kimmelstiel-Wilson Syndrome. C. Striker.—p. 768.
Retinal Changes in Diabetes Mellitus. C. J. Hargrove.—p. 772.

46:797-866 (Nov.) 1950

Some Aspects of Thyroid Disease: I. Ocular Manifestations of Thyroid Disease. P. A. Chandler.—p. 801.
Id.: II. Cardiovascular Signs of Thyroid Disease. T. J. Dry.—p. 802.
Id.: III. Differential Diagnosis of Thyroiditis. F. W. Konzelmann.—p. 803.
Id.: IV. Radioiodine in Evaluation and Treatment of Hyperthyroidism. H. B. Hunt.—p. 805.
Id.: V. Relationship of Thyroid to Sterility. R. J. Crossen.—p. 809.
Id.: VI. Prevention of Endemic Thyroid Disease. E. L. Stebbins.—p. 811.
Carcinoma of Thyroid Gland. A. O. Singleton Jr. and J. P. McNeill. —p. 813.
*Needle Biopsy of Liver: Critical Appraisal. C. T. Stone Jr. and W. C. Grater.—p. 818.
Acute Diseases of Pancreas. C. D. Reece and J. B. Burrows.—p. 826.
Surgical Treatment of Benign Gastric and Duodenal Ulcers. H. K. Gray. —p. 831.
Toxoplasmosis: Clinical, Epidemiologic, and Laboratory Aspects. S. B. Sulkin and P. M. Levin.—p. 834.
The Future of Medicine. J. W. Cline.—p. 838.

Needle Biopsy of Liver.—Stone and Grater performed 136 needle biopsies of the liver on 82 patients. No death occurred. The only alarming reaction was an acute abdominal disorder in one patient after transpleural biopsy, and this was controlled by a transfusion and general supportive measures. The subcostal is easier and less dangerous than the transpleural approach. Needle biopsy is well suited to the liver because the functional unit, the lobule, is only a few square millimeters in diameter and parts of several units are usually procured with each biopsy. Most diseases of the liver are diffuse in nature and, therefore, are accurately represented. Diagnoses made on the basis of the biopsy material were portal cirrhosis in 36 instances, viral hepatitis in 30, nonspecific hepatitis in 17 and malignant neoplasm in 11. Biopsy and necropsy correlation proved excellent in diffuse processes such as cirrhosis, hepatitis and toxic degenerations. Fifteen patients ultimately had necropsies, and nine had laparotomies. Postmortem diagnosis agreed fully with the biopsy diagnosis in 12 of the 15 cases in which autopsy was done and in seven of the nine patients who underwent exploratory laparotomy. The fundamental pathological pattern of a surprisingly high percentage of patchy lesions of the liver, such as metastatic nodules, was shown by biopsy. Needle biopsy was of decided value in the diagnosis and study of chronic viral hepatitis. Serial biopsies allowed progressive study of the benefits of therapy in chronic liver disease, particularly in fatty degeneration and cirrhosis. The progress of degenerative disease of the liver secondary to malnutrition of ethanolic origin was studied by biopsy every week for 17 consecutive weeks in one patient. Information of prognostic value was obtained in some instances. Liver function tests and needle biopsies agreed in general, but there was no obvious agreement between any one specific liver function test and microscopic change in the tissues. In some instances biopsy revealed the precise diagnosis when function tests failed to show any abnormality. Needle biopsy of the liver is a relatively safe, easily performed diagnostic procedure from which valuable information may be gained.

Union Médicale du Canada, Montreal

79:1113-1240 (Oct.) 1950. **Partial Index**

Etiology and Pathogenesis of Psoriasis. J. Charpy.—p. 1120.
Critical Study of Modern Status and Classification of Cancer of the Breast. G. Pinsonneault and A. Jutras.—p. 1131.
*Surgical Treatment of Mitral Stenosis: Commissurotomy. E. D. Gagnon and P. David.—p. 1142.
General Considerations on Cancer of Stomach. P. Smith.—p. 1148.

Surgical Treatment of Mitral Stenosis.—Gagnon and David performed commisurotomy on two men, aged 17 and 22, with rheumatic heart disease asscciated with mitral stenosis and repeated severe hemoptysis and dyspnea. The approach by the left auricular appendage, according to the method of Bailey, Glover and O'Neill, was used. Intervention was by direct finger approach. The postoperative course of the first patient was complicated by auricular fibrillation, with an average ventricular rhythm of 150. It was rapidly controlled by administration of quinidine sulfate. The second patient had to be given digitalis on the third postoperative day to prevent cardiac decompensation. Malleolar edema appeared on the tenth postoperative day but disappeared in about 10 days. The patients were discharged from the hospital six weeks after the operation and were followed for two weeks. It is too soon for evaluation of the functional results of the operation. The authors believe that surgical treatment is the method of choice for mitral stenosis, if the constriction causes hemoptysis or congestion in the lungs or if the condition immobilizes the patient to the point that he is incapable of the slightest effort.

United States Armed Forces Med. J., Washington, D. C.

1:1249-1378 (Nov.) 1950. **Partial Index**

Medical History of the Berlin Airlift. H. G. Moseley.—p. 1249.
Infant Diarrhea. A. Leibovitz.—p. 1265.
Clinical Use of Antibiotics: IV. Treatment of Infectious Processes. P. H. Long.—p. 1273.
Field Trial of "Shigella Flexneri III" Vaccine: Report of Bacteriologic Studies. L. A. Barnes, A. B. Smith, R. C. Durant and H. R. Dressler. —p. 1285.
Isolation of Three "Shigella Paradysenteriae" Serotypes from One Patient. R. P. Elrod, A. C. Sanders and R. L. Hullinghorst.—p. 1299.
Adenocarcinoma of Second Portion of Duodenum. A. B. Ramsay and R. E. Graf.—p. 1307.
Complications of Meckel's Diverticulum: Report of Nine Cases. L. L. Haynes and P. D. Cronemiller.—p. 1329.
Amebiasis and Complement-Fixation Test. C. F. Craig.—p. 1337.
Medical Service Field Research Laboratory. R. G. Daggs and F. J. Knoblauch.—p. 1343.
The British Army Divisional Medical Organization. R. D. Cameron. —p. 1347.
Female Staffing Program in Army Hospital. J. T. Gray.—p. 1355.
About the Army Medical Service: I. Draft of Doctors of Medicine, Dentistry, and Veterinary Medicine. P. I. Robinson.—p. 1359.
Id.: II. Medical Service in Action. P. I. Robinson.—p. 1363.

Urologic & Cutaneous Review, West Palm Beach, Fla.

54:641-704 (Nov.) 1950. **Partial Index**

*Cancer of Kidney. H. L. Kretschmer.—p. 641.
Uretero-Intestinal Anastomosis in Inoperable Carcinoma of Urinary Bladder. J. J. Crane.—p. 645.
Surgical Treatment of Male Infertility. L. F. Torres Jr.—p. 648.
Patent Urachus. N. Leitch.—p. 656.
Retropubic Prostatectomy: Critical Review of 99 Consecutive Private Cases. F. A. Bennetts.—p. 658.
Passage of Shell Fragment from Renal Pelvis to Lower Ureter. Removal by Ureterotomy. J. M. Howard and B. Hughes.—p. 664.

Cancer of Kidney.—Kretschmer states that almost all kidney tumors are malignant. The classic triad of symptoms is hematuria, tumor mass and lumbar pain, but these never occur together early in the disease process. Hematuria may be an early or a late symptom. It is the initial symptom of about 40 per cent of patients. Pain associated with renal neoplasm may be spontaneous, intermittent or constant, colicky or dull. Occasionally the pain may radiate along the distribution of the iliac, inguinal or genitocrural nerves and be referred to the lumbrosacral joint, hips, thighs or knees. In the early stages, there may be little change in the shape and size of the kidney, and the tumor cannot be palpated. In the late stages, a palpable mass can be demonstrated in the renal area. The diagnosis is based on the history, physical examination, the urologic examination, cystoscopy and pyelography. Cystoscopic examination aids in determination of the site of the bleeding as well as the function of the opposite kidney. It also rules out the possibility that the bleeding is vesical in origin. Intravenous urography is a routine procedure in cases in which a tentative diagnosis of cancer has been made. If the filling defect fails to confirm the tentative diagnosis, a retrograde pyelogram should be done. In doubtful cases a second retrograde pyelogram must be carried out in six or eight weeks. The Papanicolaou test apparently is of greater value in tumors of the renal pelvis than in tumors of the renal parenchyma. The only hope for the cure of cancer of the kidney lies in nephrectomy before metastases have developed. Wilm's tumor, or embryonal adenomyosarcoma, is essentially a disease of infancy and is highly malignant. The presence of a tumor mass in the renal area in a child suggests a Wilms' tumor. A plain roentgenogram of the chest is indicated for detection of metastases, and a plain film of the abdomen will rule out stone in the urinary tract. Hydronephrosis, polycystic kidney, tumors of the adrenal gland, retroperitoneal tumors and tumors of the liver must be considered in the differential diagnosis. Since metastases from Wilms' tumors are usually blood borne, rough or repeated palpations must be avoided. Here, as in other malignant renal tumors, surgical treatment is preferable. Preliminary roentgen irradiation and nephrectomy have greatly reduced the operative mortality and increased five year cures. No cures have resulted from irradiation alone.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

58:591-666 (Nov.) 1950

Management of Cord and Placental Blood and Its Effect upon the Newborn: Part II. A. M. McCausland, F. Holmes and W. R. Schumann. —p. 591.
Surgical Repair of Injured Ureter. T. R. Montgomery.—p. 609.
Diaphragmatic Hernia in Infancy. W. E. Zeller.—p. 619.
Surgical Treatment of Infantile Inguinal Hernia with Presentation of Two Cases of Strangulation Necessitating Bowel Resection. J. L. Dixon and I. Wills.—p. 624.
Renal Complications of Parathyroid Disease. D. G. Corbett.—p. 629.
Congenital Atresia of Ileum: Report of Five Successfully Treated Cases. W. H. Snyder, J. R. Voskamp and L. Chaffin.—p. 638.
*Pulmonary Resection in Treatment of Pulmonary Tuberculosis: Study of 100 Consecutive Cases. F. J. Jarvis.—p. 643.
Bilateral Ectopic Pregnancy. H. L. Stewart Jr.—p. 648.
Pheochromocytoma. L. C. Pence.—p. 656.

Pulmonary Resection in Tuberculosis.—Jarvis studied 100 patients who had undergone pulmonary resection during the past three and a half years. The chief indications for this operation were failure of collapse therapy, high grade bronchostenosis, bronchiectasis, tuberculoma, acute tuberculous pneumonia and empyema with bronchopleural fistula. The status of the bronchus must be given careful consideration in the selection of patients for this operation. Although streptomycin has been effective in ulcerative tracheobronchitis, it has not lessened the degree of stenosis; in fact, it has sometimes increased the stenosing scar tissue. Planographic studies, routinely done when pulmonary resection is performed, often reveal bronchiectasis. Iodized oil bronchography is used only when planograms are inconclusive, because it might spread the disease to uninvolved portions of the lung. Complete pulmonary function studies have been most valuable in the evaluation of resection candidates. Fluoroscopic observation of diaphragmatic movement and behavior of chest wall and mediastinum are correlated with estimates of total lung function and differential function of each lung by bronchospirometry. The amount of gas exchange is correlated with the vital capacity, reserve air, tidal air and residual air. Certain patients have been denied operation because of insufficient reserve function to permit the excision of functioning pulmonary tissues. More patients, however, have surprising functional capacities, despite extensive pulmonary disease, and, in certain patients, unilateral emphysema and contracted lung have created a functional situation that can be much improved by pneumonectomy. The surgical mortality was 9 per cent, but in the last 50 patients it fell to 4 per cent. A total of 82 of the 100 patients have negative sputum, but 40 of them are still hospitalized. Streptomycin is of great benefit in preparation of patients for pulmonary resection.

FOREIGN

British Journal of Dermatology and Syphilis, London

62:443-484 (Nov.) 1950

Histological Diagnosis of Pemphigus. A. J. Rook and I. W. Whimster. —p. 443.
Familial Lichen Planus. Is It Significant Evidence of Infectivity? F. F. Hellier.—p. 446.
Lichen Sclerosus et Atrophicus. R. T. Brain.—p. 449.

British Journal of Experimental Pathology, London

31:449-576 (Aug.) 1950. Partial Index

Morphology of Mouse Pneumonitis Virus (Nigg) in Various Hosts. V. E. Cosslett, J. A. R. Miles and M. G. P. Stoker.—p. 454.
Experimental Enamel Hypoplasia in Rats. J. T. Irving.—p. 458.
*Biochemical Changes in Acute Beryllium Poisoning. W. N. Aldridge, J. M. Barnes and F. A. Denz.—p. 473.
Vascular Supply to Liver and Anatomy of Eclampsia. A. D. T. Govan and C. L. Mukherjee.—p. 485.
Immunological Investigations in 10 Cases of Plasmacytoma. F. H. Wuhrmann, C. Wunderly and A. Hässig.—p. 507.
Action of Penicillin on Cl. Welchii Type A. J. E. Crofts and D. G. Evans.—p. 550.

Biochemical Changes in Acute Beryllium Poisoning.—Aldridge and co-workers have previously reported on the pathological changes found in animals who died of acute poisoning as a result of intravenous injection of soluble beryllium salts. The most conspicuous lesion was necrosis of the liver, apparently initiated by the accumulation within the sinusoids of a large part of the injected beryllium. Some damage to the kidney tubules was noted, and there were changes in the white blood cells. In rabbits, there is a progressive fall in the blood sugar level until hypoglycemic convulsions develop just before death. At an earlier stage the rate of removal of injected glucose and lactate from the blood is impaired. The levels of calcium, urea and nonprotein nitrogen in the blood are not seriously affected. The serum alkaline phosphatase rises, with increasing bilirubinemia. The concentration of phosphatase in the liver also rises. On the other hand, the liver potassium and arginase levels fall progressively. All the results obtained suggested that the biochemical disturbances were the result of an increasing impairment of liver function. The results of this study confirm and amplify those of other workers and are significant because they show that beryllium salts are suitable agents for the experimental production of liver necrosis. The same dosage produced remarkably consistent effects in a variety of laboratory animals, namely, a rapidly spreading liver necrosis with few changes in other vital organs.

British Journal of Radiology, London

23:627-684 (Nov.) 1950

Non-Medical Aspects of Medical Radiology. L. H. Gray.—p. 627.
P^{32} Autoradiographs of Mouse Testis: Preliminary Observations of Timing of Spermatogenic Stages. A. Howard and S. R. Pelc.—p. 634.
Dosage Calculator for Linear Gamma-Ray Sources with Uneven Distribution of Active Material. J. F. Richardson.—p. 642.
Note on Use of Wedge Filters in Transparent Ended X-Ray Therapy Applicators. M. H. E. Hulbert and A. C. Groom.—p. 649.
X-Ray Tube Mounting for Convergent Beam Therapy Giving High Percentage Depth Dose. W. Kollibay.—p. 653.
*Radiological Appearances in Pancreatic Cancer. F. Pygott.—p. 656.
Case of Neurofibromatosis (Von Recklinghausen's Disease) Illustrating Most of Characteristic Bone Lesions. J. Mackenzie.—p. 667.
Diagnosis of Minimal Atlanto-Axial Subluxation. H. Jackson.—p. 672.

Radiological Appearances in Pancreatic Cancer.—Pygott describes the roentgenologic observations in a series of 25 patients with carcinoma of the pancreas. Barium meal examination revealed recognizable abnormalities in 16 of the patients. These include enlargement of the duodenal loop and formation of the U-shaped stomach due to an upward displacement of the pyloric region of the stomach and the duodenal cap by a neoplasm in the body or head of the pancreas. The common feature in all was displacement of the stomach, duodenum or jejunum by the pancreatic tumor, but the pattern varied greatly from patient to patient. The authors state that any alteration in the outline of these organs not characteristic of intrinsic disease should suggest a diagnosis of pancreatic carcinoma. A positive diagnosis may not be possible from the roentgenogram alone, but in conjunction with the history and physical examination it often leads to the correct diagnosis. Negative radiological observations, on the other hand, by no means exclude the presence of pancreatic neoplasm. It should also be pointed out that enlargement of the duodenal loop may be due to causes other than pancreatic neoplasm or pancreatic cyst.

British Medical Journal, London

2:1129-1184 (Nov. 18) 1950

Freezing and Desiccation of Mouse Tumours. R. D. Passey and L. Dmochowski.—p. 1129.
Cultivation in Vitro of Frozen and Desiccated Mouse Tumour Tissues. R. D. Passey, L. Dmochowski, I. Lasnitzki and A. Millard.—p. 1134.
Cellular Transmission of Mouse Sarcomata with Frozen-Dried Tumour Tissues. L. Dmochowski and A. Millard.—p. 1136.
*Atelectasis and Bronchiectasis in Pertussis. A. W. Lees.—p. 1138.
Some Aspects of Colour-Blindness. E. N. Willmer.—p. 1141.
Influence of Ascorbic Acid on Healing of Corneal Ulcers in Man. T. A. S. Boyd and F. W. Campbell.—p. 1145.
Intraperitoneal Intestinal Anastomosis in Colectomy. W. G. Hendry. —p. 1148.
Exercises in the Bath. L. Hill.—p. 1153.

Atelectasis and Bronchiectasis in Pertussis.—Lees studied 150 consecutive cases of pertussis clinically and radiologically for occurrence of atelectasis and bronchiectasis. Atelectasis developed in 65 of the 150 patients (43 per cent). In six instances resolution of complete lobar collapse required longer than two months. In five of these, the bronchi in the collapsed lobes were dilated but reverted to their normal caliber when the lobes reexpanded. In four partially collapsed lobes, slight bronchial dilatation was noted, which disappeared when the collapsed lung reexpanded. In only one case did the attack of pertussis lead to persistent respiratory symptoms. In this case there was evidence of residual bronchial infection in a lobe that had been atelectatic for 18 weeks. Although the bronchi in this lobe were greatly dilated when it was collapsed, bronchiectasis was not obvious after reexpansion. When pulmonary collapse is caused by aspiration of sputum into the peripheral parts of the bronchial tree, postural drainage, rolling of the patient about or percussion over the affected area may be used to dislodge the peccant mucous plugs. These methods were employed in the majority of cases and the collapse was often resolved. In four cases bronchial dilatation was demonstrated in collapsed lobes. Although it could be assumed that the dilatation would disappear if reexpansion of the lobe occurred quickly enough, the author believed that bronchiectasis would be less likely to result if the affected lung were relaxed by artificial pneumothorax. This measure was instituted in three cases, but, though the effect was favorable, no conclusions can be drawn. If atelectasis is detected during or after the attack of pertussis, every effort should be made to promote reexpansion of the affected lung, which may occur even up to a year afterwards. Surgical removal of a lobe collapsed for less than a year appears inadvisable.

Edinburgh Medical Journal

57:369-432 (Sept.) 1950

*Lobectomy and Pneumonectomy for Pulmonary Tuberculosis. R. M. Janes.—p. 369.
Tuberculous Endobronchitis. R. Y. Keers.—p. 382.
Clinical Features of Bronchial Carcinoma. C. Strang.—p. 388.
Clinical Use of Hormone Determinations in Urine. H. de Watteville. —p. 403.
Treatment of Hydrocele of Tunica Vaginalis: With Report on 45 Hydroceles Treated by Injection. J. M. Ross.—p. 413.
Cerebral Cortex and Gastric Motility. B. P. Babkin.—p. 419.

Lobectomy and Pneumonectomy for Pulmonary Tuberculosis.—Janes operated on 111 patients with pulmonary tuberculosis. One of these patients had a tourniquet lobectomy performed on him in 1936, while 110 were operated on by the dissection technic during the period 1940-1949. Lobectomy was done in 55 instances, pneumonectomy in 48 and segmental or local resection in eight. The indications were a persistent cavity after

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

pneumothorax in 11 patients and after thoracoplasty in 10, uncollapsible lesion in 23, widespread disease with multiple cavities in nine, stenosis of bronchus in 27, tuberculous bronchiectasis in 16 and tuberculoma in 15. Eighteen patients died, with death immediately related to operation in five. Seventy-three patients are well, 15 are still under treatment and five were lost track of. Postoperative spread or exacerbation of the disease occurred in 27 per cent of the lobectomies and 29 per cent of the pneumonectomies. The process involved the same lung in six lobectomies, the contralateral lung in eight and was bilateral in three. The results of the procedure can be regarded as reasonably satisfactory when it is realized that the group comprised patients in whom other types of treatment had failed and those in whom no other kind of treatment was likely to be effective. Excision should not be regarded as a substitute for the other types of therapy, particularly for thoracoplasty. The fact that the average mortality from 589 thoracoplasties done in the six year period from 1942 to 1948 was 1 per cent illustrates the relative risk of the two procedures. The use of streptomycin has made it possible to extend somewhat the indications for resection. Neither lobectomy nor pneumonectomy should be undertaken when it would be necessary to divide the bronchus through an area showing tubercles or active ulceration.

Journal of Laryngology and Otology, London

64:611-686 (Oct.) 1950

Attic Suppuration. A. Tumarkin.—p. 611.
Bilateral External Laryngocele Ventricularis. H. Butler.—p. 625.
Operation for Relief of Bilateral Vocal Cord Paralysis. A. Réthi.—p. 632.
Report of Three Cases of Naso-Alveolar Cysts. P. A. Thorpe.—p. 640.
Case of Petrositis in Childhood Reviewed 14 Years Later. W. S. Adams. —p. 642.

Journal of Physiology, Cambridge

3:215-444 (Oct. 16) 1950. **Partial Index**

Cytoplasmic Constituent of Brain. K. C. Dixon and B. M. Herbertson. —p. 244.
*Pituitary Gland and Blood Lymphocytes. H. F. Colfer, J. De Groot and G. W. Harris.—p. 328.
*Hypothalamic Control of Anterior Pituitary Gland and Blood Lymphocytes. J. De Groot and G. W. Harris.—p. 335.
Nature of Limitation of Maximal Inspiratory and Expiratory Efforts. J. N. Mills.—p. 376.
Intrinsic Independence of Blood Flow Through Cortical and Juxtamedullary Glomeruli. H. Lamport.—p. 394.
Afferent Nerves from Heart Region. C. J. Dickinson.—p. 399.
Electromotive Action of Acetylcholine at the Motor End-Plate. P. Fatt. —p. 408.
Urinary Excretion of Phosphate in Man and the Cat. M. G. Eggleton and Y. A. Habib.—p. 423.

Pituitary Gland and Blood Lymphocytes.—Colfer and his associates suggest that the production of a temporary lymphopenia might be used as an indicator of the secretion of pituitary adrenocorticotropic hormone (ACTH) by the anterior pituitary gland. In previous experiments in unanesthetized rabbits the authors stimulated electrically various regions of the hypothalamus and pituitary gland by the remote control method to determine whether lymphopenia might be so produced. For this method of stimulation it was necessary to immobilize the rabbits in clamps for as long as two hours. These experiments were stopped, however, when it was found that the emotional stress involved in immobilization (without electrical stimulation) was sufficient to produce the lymphopenic response. The present paper deals with the role of the pituitary gland in this reaction to emotional stress. Emotional stress (restraint or subcutaneous faradic shocks) in normal rabbits resulted in pronounced absolute lymphopenia, which was generally accompanied with absolute granulocytosis. The lymphopenia was maximum at about the third hour after the stimulus. Emotional stress in hypophysectomized rabbits failed to produce any lymphopenia, though the granulocytosis was not abolished. Intravenous injection of pituitary extract still evoked lymphopenia after hypophysectomy. Denervation of the adrenal glands did not alter the lymphopenic response to stress. Intravenous injection of epinephrine did not produce lymphopenia in most of the animals. It is concluded that the adrenal medulla plays little part in the reaction. The lymphopenic response is the quickest indicator of anterior pituitary activity known.

Hypothalamic Control of Anterior Pituitary and Blood Lymphocytes.—De Groot and Harris found that electric stimulation of the posterior region of the tuber cinereum or of the mammillary body of unanesthetized, unrestrained rabbits resulted in lymphopenia, which was similar in time relations and magnitude to that following an emotional stress stimulus. Cervical sympathectomy did not abolish this response. Electric stimulation of certain other regions in the hypothalamus (including the supraopticohypophysial tract), of the pars tuberalis, pars distalis, pars intermedia and infundibular stem of the pituitary gland did not elicit the response. The lymphopenic response that follows an emotional stress stimulus in normal rabbits was abolished by lesions in the pars tuberalis (two cases), and, in most cases, was abolished or diminished by transverse lesions in the posterior region of the tuber cinereum or in the mammillary body. Similar lesions in the pars distalis and pars intermedia, and lesions which interrupt the infundibular stem, were compatible with normal responses. It is concluded that anterior pituitary secretion (probably of the adrenocorticotropic hormone) is under neural control via the hypothalamus and the hypophysial portal vessels of the pituitary stalk.

Lancet, London

2:505-548 (Nov. 11) 1950

Surgery of Sympathetic Nervous System. J. Learmonth.—p. 505.
*Rice Diet in Treatment of Hypertension: Report to Medical Research Council. D. R. Cameron and others.—p. 509.
Viraemia in Smallpox. A. W. Downie, K. McCarthy and A. Macdonald. —p. 513.
Laboratory Investigation of Smallpox Patients with Particular Reference to Infectivity in Early Stages. F. O. MacCallum.—p. 514.
Effect of Cortisone on Early Fibrosis of Liver in Rats. K. Aterman. —p. 517.
Walking-Plaster Appliance. D. G. Wright.—p. 519.
Serum Factor in Rheumatoid Arthritis Agglutinating Sensitised Sheep Red Cells. J. Ball.—p. 520.

Rice Diet in Hypertension.—A committee of British physicians carried out a short term clinical trial of the Kempner rice diet in hypertensive patients. The diet, given for an average of 41 days, consisted of 250 to 350 Gm. of rice per day, plus fruit, fruit juice, sugar, vitamins and, in a few cases, ferrous sulfate. This provided 2,000 calories per day with 20 Gm. of protein, 59 Gm. of fat and not over 150 mg. of sodium. One liter of fluid was allowed per day. The diet was given to 36 patients with essential or renal hypertension, all of whom had diastolic pressures over 120 mm. of mercury after 10 days of moderate bed rest. One patient died while on the diet. In about 70 per cent of those remaining there was a significant fall in blood pressure accompanied with symptomatic relief. The average decrease in systolic pressure was 55 mm. of mercury and in diastolic pressure 26 mm. This fall was greater than that obtained from barbiturate therapy alone but not as great as that obtained with the rice diet plus barbiturates. Blood pressure remained low as long as the diet was continued but rose rapidly on resumption of an ordinary low sodium diet. The addition of sodium chloride to the rice diet produced a rise in pressure in eight of 11 patients; the addition of calcium caseinate did not. In 13 patients there was roentgenologic evidence of decrease in heart size, but improvement in the electrocardiogram and in the eye grounds occurred in only a few cases. All patients lost weight due to a negative nitrogen balance or to reduction in edema. There was a decrease in blood urea and chlorides in every case and a decrease in cholesterol in those with originally high levels. A reversible impairment of renal function occurred during therapy, glomerular filtration being affected more than tubular reabsorption. The authors warn that this may lead to fatal uremia if the impairment is great enough and if the diet is continued. They suggest that the blood urea and sodium be watched carefully. They feel that the rice diet will never become popular in Great Britain because it is so unappetizing and monotonous that few patients can be persuaded to adhere to it longer than six weeks.

Acta Chirurgica Scandinavica, Stockholm

100:293-388 (Oct. 21) 1950. Partial Index

Use of Plastics in Surgery. J. Bing.—p. 293.
Complications After Ulcus Resections. A. Grevillius.—p. 311.
*Surgical Treatment of Splenomegaly in Patients with Esophageal Varices. S. Bruzelius.—p. 327.
Acute Hyperparathyroidism. N. Blixenkrone-Møller.—p. 337.
Value of Collateral Circulation from Inferior Mesenteric Artery in Obliteration of Lower Abdominal Aorta. B. L. Lindström.—p. 367.
Spinal Fusion in Low Back Pain. H. Wahren.—p. 375.

Surgical Treatment of Splenomegaly.—Recent investigations, particularly by American workers, have demonstrated that Banti's syndrome is a manifestation of a stasis in the portal bed and that consequently the term Banti's syndrome should be superseded by the term portal hypertension. The disorder is caused either by an extrahepatic obstructive factor or by an intrahepatic block—cirrhosis. Formerly, splenectomy was usually done, but today, especially in the United States, the disease is treated by establishment of a portacaval shunt plus, in selected cases, esophagogastrectomy. Bruzelius presents observations on 17 patients who were treated between 1931 and 1949 at the University Hospital in Lund, Sweden, and who had been given such diagnoses as Banti's syndrome, splenomegaly, thrombosis of the splenic vein, cirrhosis, and esophageal varices. In all the 17 cases, the history, clinical data, surgical observations and, in some cases, autopsy suggested the presence of portal stasis. The term portal hypertension had not been used in the original records, because this term has been adopted only recently. The obstructive factor was extrahepatic in 10 and intrahepatic in seven. Splenomegaly was present in all the patients with extrahepatic obstruction and in four of those in whom the site of the block was intrahepatic. Esophageal varices were established roentgenographically in six of the extrahepatic cases and in five of the intrahepatic cases. In the 10 patients with extrahepatic block, surgical intervention was limited to splenectomy in seven cases, to Talma's operation in one case and to exploratory laparotomy in one case. In the remaining case, the patient with portal stasis and splenomegaly refused operation. Of the seven cases in the intrahepatic group, only three were operated on. Talma's operation was done in one case, exploratory laparotomy in the second case and splenectomy with splenorenal anastomosis in the third case. The results of splenectomy alone are rather discouraging, since this operation will not by itself give a permanent cure, unless the obstructive factor is located in the splenic vein near the spleen. The procedures introduced by American workers seem to be promising, especially splenorenal anastomosis in combination with splenectomy.

Acta Medica Scandinavica, Stockholm

138:319-390 (Oct. 10) 1950. Partial Index

Causes of Death in Aged Persons with Diabetes Mellitus. S. Oldberg.—p. 319.
Medical and Modern Surgical Treatment of Chronic Ulcerative Colitis. O. Kapel.—p. 328.
Paper Chromatographic Analysis of Amino Acid Excretion in Wilson's Disease. C. H. de Verdier.—p. 344.
Pseudoappendicitis. M. G. Good.—p. 348.
Clinical Aspects of Cardiac Asthma and Acute Pulmonary Edema with Special Reference to Blood Pressure. I. Sonne and T. Hilden.—p. 354.
Hemopathic Mediterranean Syndrome. P. De Muro and G. Leonardi.—p. 362.
*Urinary 17-Ketosteroids in Active Pulmonary Tuberculosis: Androgenic Function. P. A. Bastenie and K. Kowalewski.—p. 376.

Urinary 17-Ketosteroids in Pulmonary Tuberculosis.—Some investigators deny the occurrence of adrenal insufficiency in pulmonary tuberculosis. Others regard the symptoms of asthenia and hypotension and the response following treatment with adrenal cortical extracts as evidence of minor degrees of insufficiency. Bastenie and Kowalewski explored this problem further by using the level of 17-ketosteroids in the urine as a test for adrenal insufficiency. This level is considered a result of the secretory activity of both the adrenal cortex and the testes, the usual values ranging between 8 and 22 mg. per 24 hours in the adult male, with an average of 14 mg., and from 6 to 14 mg. in the normal female, with an average of 4.9 mg. The elimination of 17-ketosteroids was studied in 35 men and 10 women hospitalized for active pulmonary tuberculosis. Sixty-five patients who had nontuberculous disorders were controls. Comparison of the results shows a statistically significant lowering of the daily 17-ketosteroid output in tuberculous patients. This lowering was correlated with the severity and duration of the tuberculous process. No definite lesions were observed in the adrenals in cases in which autopsy was performed. The authors suggest that the tuberculous infection may play a nonspecific role in the depression of adrenal cortical function.

Athena, Rome

16:207-234 (Oct.) 1950. Partial Index

*Streptomycin in Tuberculous Meningitis and in Miliary Tuberculosis: Results in 235 Cases at Clinica Pediatrica of Genoa. G. De Toni.—p. 207.

Tuberculous Meningitis and Miliary Tuberculosis.—De Toni treated 141 patients with tuberculous meningitis and 72 patients with miliary tuberculosis with streptomycin. The patients were chiefly infants and children, but the group also included adolescents and adults. Patients with tuberculous meningitis were given a daily intraspinal injection of streptomycin in doses of 20 mg. for infants and of 70 to 80 mg. for adolescents and adults, for three months. After this period the dose for daily intraspinal injection was diminished gradually. The intraspinal injections were continued up to the sixth month. After this period the injections were given in the same dose, every other day, up to one month after the cerebrospinal fluid became normal. Daily intramuscular injections of streptomycin in doses of 30 mg. per kilogram of body weight were administered simultaneously until the cerebrospinal fluid became normal, with monthly interruptions for five days. In six cases of partial or total blockage of the cerebrospinal fluid, half the dose of streptomycin that was given intraspinally was injected suboccipitally or intraventricularly. At the same time, 5 or 10 mg. of streptomycin was injected intraspinally. Patients with miliary tuberculosis were given daily intramuscular injections of streptomycin for five to seven months. The patients in both groups were given paraaminosalicylic acid by mouth in doses of 30 or 40 mg. per kilogram of body weight. Complete recovery was obtained in 70 per cent of patients with tuberculous meningitis and in 76 per cent of patients with miliary tuberculosis.

Beiträge zur Klinik der Tuberkulose, Heidelberg

104:107-178 (Oct. 2) 1950. Partial Index

Experiences with BCG in Schleswig-Holstein. J. Hein.—p. 107.
Psychotherapy in Tuberculosis Sanatoriums. W. Hoelemann.—p. 133.
Primary Tuberculosis in Pulmonary Apex. A. Ravelli.—p. 137.
Tuberculosis After Gunshot Wounds: Problem of Traumatic Tuberculosis. W. Seyler.—p. 140.
*Experience with Streptomycin in Collapse Therapy of Pulmonary Tuberculosis. W. Glaser.—p. 155.

Streptomycin in Collapse Therapy of Pulmonary Tuberculosis.—Glaser reviews the results of streptomycin therapy in about 150 patients with pulmonary tuberculosis, the majority of whom also received collapse therapy. The usual dose was 1 Gm. per day injected intramuscularly in two divided doses. This treatment was continued for about 90 days. Smaller doses were not as effective. The author found that streptomycin is not a panacea for tuberculosis. It does not replace the proved methods of collapse therapy but is a valuable adjunct to these methods. With few exceptions, it transfers the acute inflammatory exudative lesion into a productive indurative focus. Small pulmonary foci of tuberculous necrosis and small cavities seem to be amenable to treatment with intramuscular injections of streptomycin, but large cavities do not seem to be affected. Intracavitary application of streptomycin seems to be effective in some cases. The cicatrization of large foci undergoing collapse therapy seems to be favored by streptomycin therapy. Tuberculous fistulas seem to be particularly responsive to streptomycin.

Deutsche medizinische Wochenschrift, Stuttgart

75:1459-1494 (Nov. 3) 1950. **Partial Index**

*Polyarthritis in Early Stage of Inoculation Hepatitis. G. A. Martini. —p. 1464.
Bacteriologic Examination of Sputum and Its Significance in Diseases of Respiratory Passages. W. Thurner.—p. 1468.
Theory of Choline Therapy and Results of Its Practical Application in Liver Diseases. H. Ott.—p. 1473.

Polyarthritis in Early Stage of Inoculation Hepatitis.—Martini has noted that clinical differentiation between epidemic hepatitis and homologous serum hepatitis is almost impossible, but that in homologous serum hepatitis (also known as inoculation hepatitis) the preicteric phase is frequently protracted and is usually accompanied with arthralgia and loss of appetite. He observed in 102 patients with inoculation hepatitis, 18 patients with severe polyarthritic changes, several weeks before the icterus became manifest. The arthritic symptoms disappeared promptly when the icterus appeared. The history and the symptomatology in the 18 patients definitely indicated inoculation (homologous serum) hepatitis. Cases of icterus preceded by attacks of polyarthritis are not a hepatic disease of allergic origin but are to be regarded as a virus hepatitis in which articular symptoms may appear during the stage of generalization. Differentiation of this disease from rheumatic polyarthritis can be made by the fact that the erythrocyte sedimentation rate is much lower than in rheumatic polyarthritis. So-called arsphenamine rheumatism is probably part of the same entity.

Doc. Neerland. et Indon. de Morbis Trop., Amsterdam

2:193-288 (Sept.) 1950. **Partial Index**

Study of Filariasis in Surinam. P. H. J. Lampe.—p. 193.
Virus of Murine Typhus in Mites (Schöngastia Indica, Fam. Trombiculidae). R. Gispen.—p. 225.
Perforation of Amebic Hepatic Abscess into Pericardial Cavity. P. H. Hartz.—p. 231.
*Malnutrition, Hepatitis and Hepatic Cirrhosis. M. Straub and A. Schaberg.—p. 238.
Schistosomiasis: Biopsy of Liver and Rectal Mucosa. J. A. G. ten Berg. —p. 260.
Occurrence of Protozoan-like Cells in Gastrointestinal Ulcers in Adults. P. H. Hartz.—p. 266.

Malnutrition, Hepatitis and Hepatic Cirrhosis.—Straub and Schaberg examined the livers of 60 severely cachectic Indonesians and found advanced atrophy in 27, atrophy with fatty degeneration in 11, annular cirrhosis in three, acute hepatitis in 10 and acute, subacute and recurring yellow atrophy in seven patients. For comparison, the authors examined the livers of Indonesians who seemed well nourished and who died from war injuries or were killed in accidents. No acute yellow atrophy was observed in this group. There was only one case of hepatitis, and there were two cases of hepatic cirrhosis. The strikingly low vitamin A content of the liver in both groups indicates that the apparently normal persons were also in a condition of malnutrition. Atrophy of the liver, fatty degeneration and annular cirrhosis were considered an immediate consequence of extreme malnutrition. In hepatitis and acute yellow atrophy an infectious cause is probable, acute atrophy being the most severe form of hepatitis. It is suggested that cachectic hepatitis is identical with European infectious hepatitis and is a sequela of virus infection. The authors believe that the prevalence of tropical hepatic cirrhosis is due to the combined action of two etiological factors, malnutrition and virus infection. The tendency to nodular regeneration of hepatic tissue under the influence of deficient nutrition turns the reparative process after infectious hepatitis in the direction of Laennec's cirrhosis and also conditions the tissues for the development of primary carcinoma of the liver.

Giornale di Clinica Medica, Parma

31:1085-1196 (Sept.) 1950. **Partial Index**

*Clinical Forms of Leptospirosis Icterohaemorrhagica. G. Scotti.—p. 1085.

Spirochetal Jaundice.—In the seven cases of leptospirosis icterohaemorrhagica reported by Scotti the clinical diagnosis was confirmed by strongly positive agglutination reactions for the causative organism in the blood serum of the patients. All patients were either engaged in cleaning a canal containing waste waters from the city of Pisa or were laundresses doing wash in these waters. The disease was of the icteric form in six cases and of the febrile meningeal pulmonary form in one case. In the icteric patients the disease started with typical symptoms in five cases and with hepatic colic in one case. Jaundice was acute and typical in five cases and of the subicteric type in one. Only one patient had acute pruritus. All six patients had photophobia, conjunctival hyperemia and pain from pressure on the eyeballs; one had bilateral iridocyclitis. Herpes of the lips occurred in three patients. Three had enlarged lymph nodes, five had pronounced splenomegaly and hepatomegaly, and one had moderate insufficiency of the liver. All six had renal disorders, with albuminuria, microscopic hematuria and cylinduria. Three had epistaxis and subcutaneous hemorrhages, while one had bleeding from the intestines. Arterial hypotension was present in five, and bradycardia in four. The patient with the meningeal and pulmonary form of the disease showed symptoms limited to these regions. In all seven patients, examination of the peripheral blood in the acute stage of the disease showed moderate anemia, a normal number of leukocytes and lymphocytosis. The author emphasizes the diagnostic importance of these observations in a disease that has such varied clinical forms.

Helvetica Medica Acta, Basel

17:279-572 (Oct.) 1950. **Partial Index**

Clinical Aspects and Epidemiology of Q Fever. O. Gsell.—p. 279.
Functional Liver Diagnosis. H. Baur.—p. 316.
Hematology and Biopsy in Liver Diseases. H. Lüdin.—p. 340.
Method of Liver Biopsy by Means of Puncture. H. R. Stettbacher and C. Huber.—p. 399.
*Aureomycin in Treatment of Epidemic Hepatitis and Related Forms of Jaundice. E. Rissel.—p. 404.

Aureomycin in Treatment of Epidemic Hepatitis.—Rissel used aureomycin in the treatment of 10 patients with epidemic hepatitis. The case history of one of these patients is presented. This woman had dark urine for several days and felt extremely fatigued. Her color was subicteric; her liver was palpable two fingerbreadths below the costal arch, and her spleen was somewhat enlarged. The bilirubin and urobilinogen contents of the urine were greatly increased. Several liver tests indicated a parenchymal lesion. The diagnosis was further corroborated by liver puncture. The patient was given 3 Gm. of aureomycin daily by mouth. In later cases the dosage was changed so that the patients were given 1 Gm. of aureomycin on the first day by intravenous injection (dissolved in isotonic sodium chloride solution) and 2 Gm. by mouth. On the three days following, they were given 0.5 Gm. intravenously and 1.5 Gm. by mouth. The course of the hepatitis in the 10 aureomycin-treated patients was greatly shortened in comparison with the course in 35 patients not so treated. The author believes that antibiotics will be effective in hepatitis only if treatment is begun early.

Klinische Wochenschrift, Heidelberg

28:729-760 (Nov. 15) 1950. **Partial Index**

*Anatomic Changes in Lungs in Syphilis with Early Generalization: Contribution to the Problem of "Miliary Pulmonary Syphilis." R. Gädeke. —p. 741.
Hormone Assays During Testosterone Therapy for Mammary Carcinoma. W. O. Jorde.—p. 744.
Clinical Use of Soulier's Micromethod for Prothrombin Determination. G. Uhlmann and R. Johow.—p. 747.
Electrophoresis in the Clinical Laboratory. W. Geissen, B. Schuler and H. F. Schuster.—p. 751.

Miliary Pulmonary Syphilis.—Gädeke says that clinicians generally maintain a skeptical attitude toward so-called miliary tuberculous syphilis. The diagnosis of these cases is usually based on the lack of proof of tuberculous origin and the efficacy of antisyphilitic treatment. Gädeke cites histories of two patients who had roentgenologic signs of miliary pulmonary syphilis and in whom it became possible to make anatomic studies on the lung tissue during necropsy. The focal, granulomatous and necrotic changes found in the lungs of these patients suggested tuberculous lesions, but no primary lesions,

other changes typical of tuberculosis, tubercle bacilli or spirochetes could be found. The existence of a syphilitic infection can be regarded as established in both patients. In the first patient, 17 months had elapsed between the onset of syphilis and the detection of the roentgenologic pulmonary changes; in the second patient this interval was shorter. In both patients the pulmonary reaction probably occurred during the secondary stage of the syphilitic infection. Proliferating and granulating processes in the small vessels and in the adventitial reticulum are characteristic of the early generalization of syphilis, as demonstrated by histological studies of the skin. The adventitial nodule formations in the author's second case correspond to the tissue changes in generalized papular syphilids, and the tissue changes in the first patient correspond to the vascular reactions in nodular syphilids. The author believes that the described pulmonary changes were syphilitic processes. If the lesion is sufficiently intense, it will appear in the roentgen picture as "miliary" changes. The fact that both patients had received inadequate antisyphilitic treatment is regarded as important.

Lille Chirurgical

5:213-264 (Sept.-Oct.) 1950. **Partial Index**

Tumors of Mediastinum: Exeresis by Extensive Thoracotomy: Recovery. P. Razemon, N. Grégoire, R. Delacroix and D. Duthoit.—p. 213.
*Ligation of Inferior Vena Cava for Phlebitis Causing Pulmonary Embolism: Report of Four Cases. J. Vandecasteele.—p. 221.
Cardiopneumatic Syncope: Resuscitation by Transdiaphragmatic Heart Massage and Intracardiac Injection of Epinephrine: Eventual Death Caused by Cerebral Accidents. E. Delannoy and Y. Betzel.—p. 227.
*Indications for and Results of Topectomy and Leukotomy in Surgical Intervention to Alleviate Intractable Pain. Laine and Soots.—p. 230.

Ligation of Inferior Vena Cava.—Vandecasteele ligated the inferior vena cava in four women between the ages of 28 and 45, two of whom had typical phlebothrombosis complicated by embolic infarction after surgical intervention for retroversion of the uterus. The third patient had phlegmasia alba dolens of one month's duration, associated with a large submucosal fibroma of the uterus and repeated hemorrhage. The sudden occurrence of severe thoracic pain as well as the alarming general condition of the patient were the indications for surgical intervention. The fourth patient had unilateral phlebitis with mild edema after the spontaneous abortion of a three month fetus. Agraphia and motor aphasia occurred suddenly, masking pulmonary embolism. Ligation of the inferior vena cava was performed by the right iliolumbar-subperitoneal route in three patients and by the transperitoneal route in the patient with fibroma of the uterus, since hysterectomy was performed in the same stage. The subperitoneal route is recommended by the author because it facilitates exposure of the venous bifurcation. Intervention was limited to ligature above the iliac bifurcation in three instances. The vein was sectioned between two ligatures in the fourth instance. Results were highly satisfactory. Emboli were prevented from being carried into the blood stream, and, in addition, there was immediate recovery from pleurodynia due to fixation of a clot. There was residual persistent edema in two patients, which probably did not result from ligature of the vena cava but was due to extensive thrombosis of the veins of the leg. Ligation of the inferior vena cava is not indicated in cases of phlebitis without embolic episodes. Complete prophylaxis of pulmonary embolism is not yet possible, but anticoagulant therapy and, in case of its failure, ligation of the inferior vena cava are effective methods for the prevention of recurrent embolism.

Topectomy and Leukotomy for Relief from Pain.—Laine and Soots performed bilateral topectomy on a man with refractory pain in the stump of an amputated left arm, and they performed unilateral topectomy on the side opposite the pain on one man and one woman with painful stumps of the left and right arm respectively. Much improvement resulted in all three patients, and the degree of improvement was the same whether the intervention was bilateral or contralateral. One anxious and depressed patient, with cancer of the third thoracic vertebra associated with unbearable pain, obtained much relief from bilateral topectomy. Homolateral topectomy was performed on a woman with severe, intractable pain in the lower extremity associated with cancer of the cervix; her pain was greatly alleviated. Intractable sacral pain following surgical intervention for cancer of the cervix was improved considerably by bilateral leukotomy in another female patient. In a boy aged 10 with lymphosarcomatosis and osteocopic pain, bilateral topectomy failed completely, perhaps because of the age of the patient. The authors stress the fact that pain did not disappear completely but lost its agonizing character in six of the seven patients reported on. The appearance of pain in new locations due to metastasis was not prevented even by bilateral topectomy. Leukotomy according to Popen's technic does not induce personality changes and may be done more rapidly than topectomy. Preference should be given therefore to leukotomy in debilitated patients with cancer. Prefrontal intervention should be prefered to commissural myelotomy. Cortical intervention has a favorable effect also on the anxiety of cancer patients. The cases reported on represent indications of choice for topectomy or leukotomy.

Maandschrift voor Kindergeneeskunde, Leyden

18:285-324 (No. 8) 1950

*Importance of Pathogenesis of Tuberculous Infection for Course of Tuberculous Meningitis in Children After Treatment with Streptomycin. A. de Minjer.—p. 285.

Influence of Pathogenesis on Course of Tuberculous Meningitis.—Necropsy was done in the cases of 11 children who had been treated with streptomycin for tuberculous meningitis. In five of the children streptomycin had not influenced the course of the disease, whereas in the other six it had prolonged life considerably. Lack of response in the first five cases was demonstrated also in the microscopic tissue examinations. These five children all had an extensive primary complex of recent origin in the lungs and in the lymph nodes. Three had multiple primary pulmonary lesions, and two had a single large primary lung lesion associated with perforation of caseated lymph nodes and bronchogenic dissemination to other areas of lung. Moreover, many other organs showed extensive dissemination of the tuberculous process. In the six children in whom life was prolonged by therapy, the primary complex was small and not of such recent origin, as indicated by the presence of calcification. The hematogenous lesions were also healed or practically healed. The clinical histories indicated that, in the first series of cases, primary infection, dissemination and meningitis developed in rapid succession, whereas, in the six children with the longer survival, much time elapsed between these various stages, at least between the primary infection and the dissemination. It seems probable that in the five rapidly fatal cases a massive infection played an important role in the pathogenesis, and the author feels that these differences in the pathogenesis of the two series largely explain the response or lack of response to the streptomycin therapy.

Minerva Medicolegale, Turin

70:81-160 (Sept.-Oct.) 1950. **Partial Index**

*Exchange Blood Transfusions in Aniline Poisoning. A. Pignero.—p. 135.

Exchange Blood Transfusions in Aniline Poisoning.—Pignero directs attention to the value of exchange blood transfusions in the treatment of aniline poisoning. Two children were admitted to his hospital with grave symptoms of acute aniline poisoning, which was caused by the wearing of shoes recently dyed with a substance containing aniline. The patients exhibited partial coma, dyspnea, cyanosis, urobilinuria and acetonuria. Methemoglobin was identified in the blood of both patients by spectroscopic examination. Oxygen alone or in mixture with carbon dioxide and injections of methylene blue were ineffective. A total of 130 cc. of blood was removed, and 150 cc. of blood was infused. The patients were given cardiac tonics and hypodermoclysis. One patient recovered after one transfusion. The other patient required four exchange transfusions. The exchange transfusion of blood should be of value in industrial poisoning with aniline.

Münchener medizinische Wochenschrift, Munich

92:1261-1340 (Nov. 10) 1950. **Partial Index**

Clinical and Physiological Significance of Size of Heart. H. Dietlen. —p. 1261.
Guiding Symptom: Unconsciousness. H. Baur.—p. 1267.
Recent Results of Studies on Hemoglobin. W. Stich.—p. 1275.
Behavior of Blood Sedimentation Rate when Erythrocyte-Blood Plasma Ratio Has Been Changed by Autoplasmotherapy, Heteroplasmotherapy and Administration of Isotonic Sodium Chloride Solution: Contribution to Problem of Blood Sedimentation Rate. K. Wahl.—p. 1285.
*Canicola Fever in Hannover. P. Wedekind and K. F. Steigner.—p. 1291.

Canicola Fever in Hannover.—Wedekind and Steiger report the occurrence of canicola fever in three patients who had severe headache and muscle pains and a temperature as high as 104 F. when admitted to the hospital. The source of the infection with Leptospira canicola in two instances was the patients' own dogs. The third patient, a domestic servant, had to feed her employer's dog and remove its urine with her cracked hands. All the dogs had been sick with severe "canine distemper," and high Leptospira canicola titers were observed in the blood of three of the dogs examined. Two dogs died, and necropsy revealed icterus, interstitial nephritis, subpleural pulmonary hemorrhage, submucosal gastric hemorrhage and ulceration of gastric mucosa. The patients were hospitalized for 42, 62 and 19 days respectively. The diagnosis of canicola fever was established by serologic examination in all three patients. The authors emphasize the importance of the use of several strains of Leptospira canicola in the agglutination-lysis test, since occasionally only a single strain may yield a positive result, as occurred in one of their cases. Titers above 1:1,000 were still observed in two of the patients after one to two years. Relative bradycardia with a pulse rate varying between 64 and 76 per minute was observed in one patient. The blood pictures did not conform to those reported by other authors. The total leukocyte count was normal in two patients and elevated in one. There was a tendency toward lymphopenia at first and toward lymphocytosis and eosinophilia later in the disease. Serum lability tests proved a good criterion for prognosis, but were not suitable for diagnosis. Takata-Ara and formol-gel tests were negative. The inflammatory character of the disease was demonstrated by the increased blood sedimentation rate, the slightly or moderately positive Gross's test, the positive cadmium sulfate reaction and shortening of Weltmann's coagulation column. Meningitic symptoms were observed in only one case. Lumbar puncture performed on the twelfth day of the disease revealed an increase in cells to 32 lymphocytes and 3 polymorphonuclear neutrophils. The protein reactions were normal. Renal and hepatic disturbances were not observed. One patient had an exanthem on the abdomen, chest, back and extremities. Myocardial impairment occurred in two patients, with resulting mild decompensation in one. On the eighth day of the disease, one patient had conjunctivitis associated with severe chemosis. Iritis with posterior synechia developed on the eighteenth day. Headache, weakness and vertigo persisted during convalescence for about six months in two patients. One patient was unable to return to work for six months after discharge from the hospital, while the third patient was able to resume work within four weeks after discharge. Penicillin therapy in one case had no noticeable effect on the course of the disease.

Nordisk Medicin, Stockholm

44:1703-1738 (Oct. 27) 1950. **Partial Index**

Spondylarthritis Ankylopoietica Incipiens. I. H. F. H. Reiter and J. Thoms.—p. 1703.
*Spondylarthritis Ankylopoietica. E. Jonsson.—p. 1705.
*Diabetes Mellitus and Pregnancy. A. Brosset and L. Werkö.—p. 1710.
Periarteritis Nodosa with Polyneuritis: Two Cases, One of Them Treated with ACTH. E. Sahlgren and E. Hofman-Bang.—p. 1717.
Essential Hypertension Improved During Acute Hepatitis. N. S. C. Heilskov.—p. 1718.

Spondylarthritis Ankylopoietica.—Jonsson discusses spondylarthritis ankylopoietica on the basis of 59 cases, in 52 men and seven women, treated from 1924 to 1950. In the same period, 2,500 cases of polyarthritis were treated. He says that in the earlier stages spondylarthritis ankylopoietica may be difficult to diagnose, as the onset is slow and insidious, the subjective symptoms are diffuse and objective symptoms are insignificant. Roentgenography of the sacroiliac joints is important, but the diagnosis cannot be made solely on the occurrence of changes in these joints. There are evident differences between spondylarthritis ankylopoietica and rheumatoid arthritis. Spondylarthritis ankylopoietica usually sets in between the ages of 20 and 40 and is relatively rare in women; iritis occurs oftener than in rheumatoid arthritis; early acute symptoms are less common, and the disease responds better to roentgen treatment. In some cases it is difficult to differentiate between the two disorders. The etiology of spondylarthritis ankylopoietica is unknown. Roentgen treatment is generally useful, but operative intervention is not advised. It is difficult to arrive at a prognosis.

Diabetes Mellitus and Pregnancy.—Brosset and Werkö describe the course of 81 pregnancies in 63 diabetic women all receiving insulin, most of whom had had diabetes less than 13 years. In most cases the insulin requirement was unchanged during pregnancy. The fetal mortality was about 50 per cent. The three main complications of pregnancy in diabetes are toxemia, polyhydramnios and an overweight fetus. Malformations of the fetus are somewhat more frequent in diabetes. In 40 patients there were signs of toxemia in the form of albuminuria, hypertension and/or edema. Toxicosis occurs oftener in diabetic women with polyhydramnios; it was seen in nine of the 12 patients with polyhydramnios. Since the advent of insulin, the frequency of excessively large fetuses has been rather less. There was no correlation between fetal mortality and the occurrence of toxemia. Some mothers who passed through several pregnancies were always delivered of living children, others, of dead children, regardless of complications. Some unknown factor may thus cause the death of the fetus. The dangers in cesarian section are now minimal. In the case of diabetic mothers routine cesarian section in the thirty-sixth week has been suggested in order to reduce fetal mortality.

Zentralblatt für Gynäkologie, Leipzig

72:1377-1440 (No. 20) 1950. **Partial Index**

Method for Interruption of Pregnancy on the Basis of Medical Indications, with Particular Consideration of Complications. J. Erbslöh and J. Brandt.—p. 1382.
Penicillin Therapy in Gynecology. G. Effkemann.—p. 1397.
Treatment of Gonorrheal Endocarditis and Ascending Adnexitis with Penicillin. H. Finkbeiner.—p. 1402.
Treatment of Leukorrhea. E. A. Mueller.—p. 1406.
*Comparison of Sedimentation Rate in Plasma and Serum. H. Bornschein. —p. 1412.

Sedimentation Rate in Plasma and in Serum.—Bornschein points out that sedimentation rate of erythrocytes is usually determined in citrated plasma, but Klaften and others had investigated the sedimentation rate of erythrocytes, which they had obtained by centrifugation of defibrinated blood washed in isotonic sodium chloride solution. Later, other investigators compared the sedimentation rates in citrated whole blood and in defibrinated blood in patients with various internal disorders. Bornschein describes the results of such comparative tests on 570 women who were treated at the obstetric and gynecologic departments of a hospital in Hamburg. In estimating the sedimentation rate in plasma, he was interested chiefly in the one hour value, but since sedimentation in the serum suspension is much slower, he studied the two hour value. He found that comparison of the two sedimentation rates gives information about the status of an existing inflammatory process and permits differentiation of an inflammatory from a noninflammatory process, because the sedimentation rate in the serum is accelerated only during an inflammation. The comparison of these rates is of no value in the diagnosis of malignant neoplasms of the female genitalia, except in the recognition of recurrences. It is usually possible to differentiate an extrauterine pregnancy from an inflammatory process in the adnexa and in the small pelvis, because acceleration of the serum sedimentation rate does not occur in extrauterine pregnancy. The sedimentation rates were always lower in the serum than in the plasma. The two do not run parallel.

BOOK REVIEWS

The Ethical Basis of Medical Practice. By Willard L. Sperry, Dean of Harvard Divinity School, Boston. With a foreword by J. Howard Means, M.D. Cloth. $2.50. Pp. 185. Paul B. Hoeber, Inc. (Medical Book Dept. of Harper & Brothers), 49 E. 33rd St., New York 16, 1950.

This excellent monograph was stimulated by Sperry's article in the *New England Journal of Medicine* (**239**:985 [Dec. 23] 1948), which was followed by an extraordinarily favorable reaction from many practicing physicians from all parts of the country. In this study Dean Sperry has attempted to carry some of the ethical problems delineated in his original article to their ultimate conclusion. Several profound chapters on the nature of the professions, the relation of the specialist and the general practitioner, the nature of conscience, codes of medical ethics and democratic versus totalitarian medicine are included. A sympathetic consideration of the physician's relation to the life and death of his patients is presented. In general, this book has a highly erudite, humanistic approach to the role of the physician in society and is a sympathetic study of the ethical problems with which he is confronted. Many of the author's conclusions are controversial, but his treatment of each question considered is always restrained and conservative. Most physicians will enjoy reading this monograph.

A seemingly lukewarm foreword by Dr. J. Howard Means, who recently castigated the medical profession in blatant and unrestrained terms in a nonmedical publication, is included. It is unfortunate that Dr. Means, whose association with Dean Sperry evidently is close and who stimulated the writing of this book, should himself give the impression of being so little influenced by the deep humanism expressed in its pages.

Combined Textbook of Obstetrics and Gynecology for Students and Practitioners. Edited by Dugald Baird, B.Sc., M.D., D.P.H., Regius Professor of Midwifery, University of Aberdeen, Aberdeen. Fifth edition. Cloth. $12.50. Pp. 1411, with 594 illustrations. Williams and Wilkins Company, Mount Royal and Guilford Aves, Baltimore 2, 1950.

This standard Scottish textbook of obstetrics and gynecology, designed for practitioners as well as medical students, has enjoyed widespread popularity since its first appearance in 1923. Its long and successful career is understandable on several grounds. The authorship is varied and distinguished. The contributors include not only the leading exponents of obstetrics and gynecology in Scotland but also eminent scientists in allied fields. Thus the section on disorders of the newborn is by the professor of child health at the University of Glasgow; the section on radiotherapy is by the professor of medical radiology at the University of Edinburgh; the chapter on the physiology of pregnancy is by an animal nutritionist, and the development of the reproductive organs is discussed by an embryologist.

The book is replete with practical clinical instruction on most of the major disorders encountered in the field. The directions given for the management of the common complications of pregnancy and labor, although succinct, are full enough to inform the practitioner of exactly what to do under this or that circumstance. The reasons for the advice given, moreover, are documented by valuable tables showing the comparative results that have been obtained by various programs of management. The policies recommended are in keeping with the best modern practice and include discussions of many recent developments, such as the expectant treatment of placenta previa and roentgen pelvimetry. The Rh problem, however, is treated rather shabbily, with only a few brief paragraphs. The vaginal smear in the diagnosis of uterine cancer and the question of carcinoma in situ are neglected to an even greater degree. But lapses of this sort are few.

The present edition lays special stress on the preventive and physiological approach to obstetrics and gynecology, the goal being the attainment of efficient physiological reproduction. Also emphasized is the important subject of stillbirth and neonatal mortality, to which much more space is given than in previous editions. Another new and valuable feature is a chapter on the expanding field of psychosomatic medicine in obstetrics and gynecology written by the Crombie-Ross professor of mental health in the University of Aberdeen. The bibliographies are representative of the best literature in the field, both British and American. The illustrations are clear, while the many charts and diagrams add much to the lucidity of the text. This is a sound, practical book, which achieves its dual objective of providing both medical students and practitioners with the information they most need.

Practical Procedures in Clinical Medicine. By R. I. S. Bayliss, M.A., M.D., M.R.C.P., Medical Tutor and Senior Medical Registrar, Postgraduate Medical School of London, London. Cloth. 25s. Pp. 445, with 62 illustrations. J. & A. Churchill, Ltd., 104 Gloucester Place, Portman Sq., London W.1, 1950.

In this small volume the author endeavors to bring together under one cover descriptions of all the practical procedures used in the investigation and treatment of medical patients. For the most part he has been successful, but in a future edition a number of procedures might be added and others modified or omitted. The importance of an exact etiological diagnosis based on the bacteriologic examination of the various body fluids and secretions is not sufficiently emphasized. Reference to dark field examination has been completely omitted. Although liver biopsy is mentioned, other simple biopsy procedures, such as those of lymph node, skin, muscle and cervix, are neglected. The growing importance of the Papanicolaou technic in the diagnosis of cancer is not sufficiently emphasized. In the hematological section, the directions for performance of reticulocyte and platelet counts are omitted, and it is suggested that, in a future edition, some of the more recently described, relatively simple tests relating to disorders of the clotting mechanism be described. Methods of making direct eosinophil counts and their importance in diagnosis of adrenal cortex insufficiency as well as in determination of results of therapy with the new adrenal and pituitary hormones are omitted. The Addis count is not mentioned. Reference to the serum amylase determination might be substituted for the less useful urinary amylase test. The directions for performance of the sulfobromophthalein sodium test should be brought up to date, and the obsolete galactose tolerance test might be omitted from the section dealing with disorders of the liver. The section on the treatment of salt and water depletion does not belong in a volume of this nature, and the chapter on radiology might be considered outside its scope. Only a few references to original papers are given in the footnotes. A book of this type is directed chiefly to house officers and interns and to students for use during their year of clinical clerkship. Not always does the author draw a sharp distinction between those procedures that an intern can perform and those for which more experience or special training is required.

Surgery of the Shoulder. By A. F. DePalma, M.D., James Edwards Professor of Orthopedic Surgery and Head of the Department, Jefferson Medical College, Philadelphia. Cloth. $17.50. Pp. 438, with 454 illustrations. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1950.

This book is divided into the following sections: origin and comparative anatomy of the pectoral limb, normal anatomy and functional mechanism of the shoulder joint and congenital abnormalities, variational anatomy and degenerative lesions of the shoulder joint, ruptures of the musculotendinous cuff, frozen shoulder and bicipital syndrome, calcareous tendinitis of the musculotendinous cuff, dislocation of the shoulder joint, fractures and fracture dislocations of the upper end of the humerus, shoulder pain of neurogenic origin and obstetric paralysis, bone tumors of the shoulder joint and surgical approaches and procedures.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

The first section, which deals with origin and comparative anatomy of the pectoral limb, is an excellent presentation of the evolution of the upper extremities. This practical approach to embryology makes for better understanding of the contents of this work. To have combined normal anatomy and the functional mechanism of the shoulder joint as the author has done is commendable. The concept that the biceps tendon moves up and down the groove during motions at the glenohumeral joint is discarded. The reasons for this rejection are well presented. Although the author had specific reasons for combining the two subjects of variational anatomy and degenerative lesions of the shoulder joint, these could have been discussed to greater advantage had they been treated separately. The section on ruptures of the musculotendinous cuff is well done. The section on surgical approaches and procedures is well amplified by numerous clear cut illustrations. It is unfortunate that figure 355, on page 413, which pertains to the technic of disarticulation of the shoulder, is not clearly depicted.

The book is beautifully illustrated throughout and presents many excellent roentgenograms and photographs of clinical material. At the end of each chapter is a rather inclusive bibliography. The book is printed on good paper, and the type size makes for easier reading. It is authoritatively written and can be recommended to anyone interested in surgery of the shoulder.

Clinical Uses of Intravenous Procaine. By David J. Graubard, M.D., Assistant Visiting Surgeon, Cumberland Hospital, Brooklyn, New York, and Milton C. Peterson, M.D., Visiting Anesthesiologist, Research Hospital, Kansas City, Missouri. Publication number 73, American Lecture Series, a monograph in American Lectures in Anesthesiology. Edited by John Adriani, M.D., Director, Department of Anesthesia, Charity Hospital, New Orleans, La. Cloth. $2.25. Pp. 104, with 10 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; The Ryerson Press, 299 Queen St., W., Toronto 2B, 1950.

This monograph contains a rather concise review of the pertinent literature with a fairly complete bibliography. Inasmuch as the authors have had much clinical experience in the intravenous use of procaine, it is not at all surprising that their method of presentation conveys the impression that the procedure is already rather well established in the treatment of a variety of conditions. Much of the evidence offered in support of the various uses for intravenously administered procaine is not critically evaluated. Thus, intravenous administration of the drug is seemingly advocated for local anesthesia, pruritus, serum sickness and other states of sensitivity, analgesia in burns and postoperative pain, acute arrhythmias during anesthesia, pain in traumatic and inflammatory conditions, acute anterior poliomyelitis and certain other conditions. In general, the investigative work in this regard appears to be lacking in adequate control measures. Necessary comparative studies of intravenously administered procaine with other well established methods of treatment of many of the aforementioned conditions have been neglected. This is particularly unfortunate in view of the known unpleasant or dangerous side effects that may result from intravenous administration of procaine.

Annual Review of Medicine. Volume I. Windsor C. Cutting, Editor, and Henry W. Newman, Associate Editor. Cloth. $6. Pp. 484. Annual Reviews, Inc., Stanford, California, 1950.

Annual reviews have become extremely popular with the medical profession. Some provide little more than abstracts of current literature; others provide a résumé of the newer observations with a critical analysis of the importance of the work reported during the period the review embraces. The value of such a review depends largely on the editor or editorial board and the contributors.

The *Annual Review of Medicine* reviews the various fields of medicine and emphasizes the more active fields, which are considered annually, other sections being reviewed only every two or three years. The authors for volume 1 have been well selected, and the results of their work make this volume an interesting and helpful publication for the medical profession. Included are reviews of infectious diseases, diseases of the gastrointestinal tract, of the cardiovascular system and of the kidneys, nutrition in medicine, allergy, neoplastic diseases, diseases of the reproductive system, of the nervous system, of bones and joints and of the respiratory system, psychiatry, obstetrics, physical agents and trauma, anesthesia, radiology and radioactivity, diseases of the ear, nose and throat, hematology, laboratory aids to diagnosis and therapy, therapeutics and toxicology and an annotated list of reviews in medicine.

This book provides a critical assessment of work in the fields reported and avoids, as the editorial leaders had hoped, "cook book therapeutic recitals." It is not a book that should be read quickly; it is one that must be read carefully and slowly, so that there is time to pause and reflect on the content. The type could be larger but, of course, this would mean added expense.

Logan Clendening Lectures on the History and Philosophy of Medicine, First Series. I: Vesalius Four Centuries Later. II: Medicine in the Eighteenth Century. By John Farquhar Fulton, Sterling Professor of Physiology and Keeper of Medical History Collections, Yale University, New Haven. Cloth. $1. Pp. 52, with portrait. University of Kansas Press, Lawrence, Kansas, 1950.

This slim volume consists of two lectures delivered by Dr. John Fulton at the University of Kansas, inaugurating The Logan Clendening lectureship established by Mrs. Logan Clendening in honor of her distinguished husband. In the first lecture Dr. Fulton discusses the contributions of Vesalius to anatomy, particularly emphasizing his text *Fabrica* and its epitome. The English translation of these volumes by Lind was greatly stimulated by Dr. Clendening's enthusiasm. In the second lecture Dr. Fulton touches on a number of the outstanding developments in physiology, pathology and internal medicine in the eighteenth century. This volume should appeal to physicians interested in the historical background of their profession.

The American Academy of Orthopaedic Surgeons Instructional Course Lectures, Volume VII, 1950. Editor: Charles N. Pease, M.D.; Associate Editor: Sam W. Banks, M.D. Cloth. $6.50. Pp. 285, with illustrations. J. W. Edwards, 300 John St., Ann Arbor, Mich. 1950.

All orthopedic surgeons will welcome this volume of a valuable series, which records accurately the transactions of the 1950 convention of the Academy Meeting of Bone and Joint Surgeons. These volumes are the fruition of the efforts of Dr. Willis C. Campbell and Dr. Edwin W. Ryerson, two of the founders of the academy. The compilation of this volume reflects the up-to-date material on the subjects discussed. Numerous experts have collaborated to make this one of the best volumes of the series. There are many outstanding sections and contributors, including Copeland, Coley, Higginbotham, Snapper, Ferguson, Strandskov, Goff, Kite, Hart, Garceau, Kleinberg, Steindler, DePalma, Toumey, Speed, Blount, De Lorme, West, Joplin, Alldredge, Thomas, Bechtol, Ray, Lipscomb, Ghormley and Eaton.

The Pharmacopeia of the United States of America (The United States Pharmacopeia). Fourteenth Revision (U. S. P. XIV) and First U. S. P. XIV Supplement. By Authority of United States Pharmacopœial Convention, Inc., Meeting at Washington, D. C., May 14 and 15, 1940. Prepared by Committee of Revision and Published by Board of Trustees. Official from November 1, 1950. Cloth. $9. Pp. 1067. Mack Publishing Company, 20th and Northampton Sts., Easton, Pa., 1950.

The fourteenth revision of The United States Pharmacopeia became official Nov. 1, 1950. Although more than 100 drugs that appeared in the preceding edition have been deleted, the present edition is significantly larger than any of its predecessors. Alum, arsenic trioxide, calomel, mustard plaster, rhubarb, strychnine sulfate and other articles that certainly have a questionable place in modern day therapy have been rightfully replaced by such drugs as the antibiotics (aureomycin, chloramphenicol and streptomycin), the antihistaminics and the new antimalarial agents. Thus, the inevitable trend toward more rational therapeutics is evident and well recognized. It is noteworthy that chemical assays have replaced biologic assays for several drugs in the new Pharmacopeia. A spectrophotometric assay method has replaced the costly and time-consuming animal assay for vitamin A activity. Chemical methods of assay for riboflavin, cardiac glycosides and epinephrine preparations also are most desirable innovations.

QUERIES AND MINOR NOTES

MULTIPLE SCLEROSIS

TO THE EDITOR:—*A woman 40 years of age has had multiple sclerosis for 10 years and at present can barely walk. One of her chief complaints is dizziness. Please recommend treatment and discuss the possible effect of hormones, such as pituitary adrenocorticotropic hormone, cortisone, estrone, progesterone and pregnenolone.*

J. M. Hesser, M.D., Benson, Ariz.

ANSWER.—There is no known curative therapy for the specific disease process of multiple sclerosis. The presence of severe paraparesis or ataxia in a patient who has been ill 10 years suggests the presence of irreversible gliotic lesions in the motor pathways of the central nervous system. Symptomatic aid for the gait disability would depend on whether features of spasticity, flexion spasms, ataxia or weakness were predominant. Drugs with reputed antispasmodic action, such as neostigmine bromide (prostigmin®), mephenesin and curare, have not proved of definite value. No symptomatic treatment is known for ataxia. Intensive physical therapy and muscle reeducation are at times of value in improving gait dysfunction in selected cases. Dizziness, if due to a lesion in the vestibular apparatus, is probably best helped by sedation with phenobarbital. However, dimenhydrinate (dramamine®) would appear to be of benefit in treatment of the symptom of vertigo, even when this is due to structural central nervous system disease. Rapid disappearance of acute, fresh symptoms is thought by some to be promoted by vasodilator action of daily intravenous administration of tetraethyl ammonium chloride. The prevention of relapses is thought by some to be furthered by anticoagulant therapy through the daily administration of bishydroxycoumarin (dicumarol®), with steady maintenance of prolonged prothrombin times. Evidence does not now warrant final conclusions as to the value of either of these modes of therapy. Specific vitamin therapy, including vitamin B_{12}, is probably not of value. The effect of pituitary adrenocorticotropic hormone on multiple sclerosis is now under investigation. Preliminary reports do not warrant conclusions as to its efficacy. There is no evidence that the other hormones mentioned are of value. Morale-building supportive psychotherapy may be of much value in view of the reported emotional factors that may be specific to the causation or aggravation of the disease. A broad discussion of therapy in multiple sclerosis appeared in articles by Schumacher in THE JOURNAL (143:1059 [July 22]; 1146 [July 29], and 1241 [Aug. 5] 1950).

COMPLETE DIVISION OF A TENDON

TO THE EDITOR:—*Examination immediately following a laceration of the dorsum of the base of the thumb did not reveal any evidence of tendon injury. However, two days later the patient was unable to extend the distal phalanx of the thumb. Can this be anything other than a laceration of the tendon and the distal phalanx?* *M.D., New York.*

ANSWER.—It is not unusual for a patient with almost complete division of a tendon to be able to extend or flex the affected digit immediately after injury. If only a small portion of the tendon is intact, the function will apparently be normal. It may require then only a slight, sudden movement to make an incomplete division complete, and then, of course, the specific function of the affected tendon is lost. This probably is the explanation of this patient's disability. With an injury at the base of the thumb, nothing except division of the extensor pollicis longus could result in inability to extend the distal phalanx of the thumb.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

THYROTOXICOSIS

TO THE EDITOR:—*1. How long is it advisable for one to give propylthiouracil, 50 mg. tablets, two tablets three times a day, to a patient who has a chronic goiter which is unusually large but causes only slight difficulty in breathing on occasions of unusual excitement. The patient is 63 years old, does her own housework on a farm and, after taking the tablets in gradually increasing doses for about three months, says that she feels much better, sleeps better and can work better. She has little exophthalmos. She also has a coarse tremor in her fingers, which has improved recently. When medication was started, her pulse rate was 120. It is now 95 to 100 and regular. Her blood is normal. There is, however, little visible change in the size of the goiter. She maintains it is not as hard as it used to be. Under these circumstances, how long should this form of treatment be continued? The patient refuses surgical treatment. 2. In goiters of this kind, what is the relative value of radiation, propylthiouracil, iodine or irradiated iodine treatment?*

M.D., Minnesota.

ANSWER.—From the data presented it would appear that the patient is thyrotoxic. However, it would be desirable to follow the course of treatment with basal metabolism determinations. There would be no objection to a continuation of propylthiouracil, but the patient should be watched carefully for toxic symptoms. In particular, her white blood cell count should be determined not less than once a week. The data indicate that a permanent cure can be induced with propylthiouracil in about 50 per cent of patients with thyrotoxicosis, provided the drug is given long enough to maintain the basal metabolism at a normal level for about one year. Of the various types of treatment listed in the query, the most effective is radioactive iodine. If propylthiouracil proves unsatisfactory, treatment should be discontinued for two to three weeks and then radioactive iodine should be used.

SADDLE BLOCK ANESTHESIA IN OBSTETRICS

TO THE EDITOR:—*What is the status of saddle block anesthesia with the so-called hyperbaric solutions in obstetrics? Is this procedure accepted by leading obstetricians?*

M.D., Virginia.

ANSWER.—This anesthesia technic merits an important position in the management of premature labor, toxemia, and certain instrumental deliveries—particularly the posterior position of the occiput—ensuring against anoxic depression of the infant from general anesthetics. It is considered to be contraindicated in patients suffering from blood loss, as in placenta previa, in patients in whom relaxation of the corpus uteri is desired, as for version and in breech delivery or extraction. Multiple pregnancy therefore is also excluded. By and large, this technic is accepted by leading obstetricians, though some, still influenced by the high mortality and late sequelae of haphazard and unselective spinal technics in the past, are opposed.

USE OF QUININE DURING PREGNANCY

TO THE EDITOR:—*What is the effect of the following on pregnancy and lactation: (1) quinine given by injection, (2) quinacrine hydrochloride (atabrine®) administered orally, (3) chloroquine phosphate (aralen®) given orally?*

Calvin P. Wallis, M.D., Guatemala, C. A.

ANSWER.—Quinine given by injection probably has no serious effect on pregnancy or lactation. However, since quinine stimulates the uterus, the use of chloroquine phosphate and camoquin® (4-[7-chloro-4-quinolylamino]-alpha-diethylamino-ortho-cresol) is preferable for suppression or treatment of the acute attack of malaria. Quinacrine can be given by mouth during pregnancy, but chloroquine is preferable.

AGGLUTINATION REACTIONS FOR THE ENTERIC FEVERS

TO THE EDITOR:—*I would appreciate a discussion of the interpretation of agglutination reactions for the enteric fevers. 1. What organisms are used in the preparation of vaccines? 2. What is the level of the titers found in immunized persons? 3. What happens to an immunized person who suffers infection with an organism other than the enteric group (say, tuberculous peritonitis) with respect to the "H" and "O" titers? 4. What happens to a person who has had one of the enteric fevers and who has some acquired immunity, who has such an infection (as tuberculous peritonitis)? 5. Can the titer of these antibodies in apparently well persons be used as criteria for the necessity for booster shots? 6. How would one interpret the following laboratory reports: (a) A 9 year old girl who has responded dramatically to treatment with pituitary adrenocorticotropic hormone is found to have a titer of 1:1,320 for "O," while "H" is negative. Cultures of stools have been negative, and no symptoms of typhoid have been seen. The white blood cell count is 12,000. (b) A 32 year old nurse has a low grade fever of six months' duration, an "H" titer of 1:320 and an "O" titer of 1:160, without evidence of diarrhea or leukopenia. 7. I have heard it said that the "H" antigen is specific, being the flagellar antigen: yet the textbooks state that the body antigen "O" is highly specific. Could you clarify this apparent inconsistency?*

M.D., Alabama.

ANSWER.—1. Most typhoid vaccines used for military personnel are triple typhoid vaccines containing the equivalent, per cubic centimeter, of one billion Salmonella typhosa, 250,000,000 Salmonella paratyphi (para A) and 250,000,000 Salmonella schottmuelleri (para B). Strain 58, the "Panama carrier" strain of S. typhosa, is used by practically all American manufacturers and many foreign manufacturers as well. Monovalent typhoid vaccine containing just S. typhosa (one billion organisms per cubic centimeter) is widely used in civilian populations.

2. Postimmunization agglutination titers reported by different workers vary probably because of lack of uniformity of laboratory procedures employed. For example, Downie and co-workers (*Month Bull. Min. Health & Health Lab. Serv.* **1**:7, 1942) report a study of titers following immunization shown, in condensed form, in the table.

Titers Following Immunization

Agglutinating Suspension			Time Since Last Injection of TAB Vaccine		
			1 wk. to 3 mo.	3 mo. to 1 yr.	1 yr. to 3 yr.
S. typhosa		O	< 1:100	< 1:100	< 1:100
S. typhosa		H	1:100—1:400	1:100—1:400	1:100—1:200
S. paratyphi	A	H	1:800—1:1,600	1:400—1:800	1:200—1:400
S. paratyphi	B	H	1:800—1:1,600	1:400—1:800	1:400—1:800

Experience of workers at the Army Medical Service Research and Graduate School, Washington, D. C., does not agree too well with Downie's results. Siler and co-workers (Immunization to Typhoid Fever, Baltimore, Johns Hopkins Press, 1941) report results of several studies in which the average anti-O titer two weeks after immunization is 1:320 to 1:1,280 and individual values as high as 1:1,024. Anti-H titers averaged 1:640 to 1:1,280 and individual values as high as 1:20,480.

3 and 4. It is believed that anti-H agglutinins in immunized persons are so subject to nonspecific stimulation that, in any febrile infection, the titers cannot be relied on to indicate the presence of a specific enteric infection. On the other hand, there is little evidence to indicate the occurrence of nonspecific stimulation of anti-O agglutinins during pyrexial infection. Thus, in previously immunized persons or those with a previous history of enteric infection, little attention can be paid to anti-H agglutinins. However, anti-O agglutinins in a titer of greater than 1:100 six months to a year after immunization is suggestive of infection.

5. It has not been possible to establish any correlation between the number of previous immunizations or the interval of time since the last immunization and the anti-O and anti-H agglutinin response. Therefore, such titers cannot be considered reliable criteria for the necessity of booster injections (Perry, H. M.: *Am. J. Hyg.* **26**:388, 1937; Horgan, E. S.: *J. Hyg.* **32**:523, 1932).

6. (*a*) A positive anti-O titer but completely negative anti-H titer is contradictory. If the clinical syndrome strongly suggests enteric infection, the blood serum of the patient might be subjected to extensive serologic study. An infection due to a strain of Salmonella with an "O" antigen common to S. typhosa but a serologically distinct "H" antigen is a possibility.

(*b*) The persistent anti-O and anti-H titer does not necessarily indicate the existence or recent occurrence of enteric infection. Supposedly normal individuals occasionally are found with titers this high. If no change in titer is observed in frequent repeat tests, the existence of an enteric infection would be questionable.

7. In the serologic diagnosis of enteric fever it should be remembered that S. typhosa, S. paratyphi and S. Schottmuelleri all share the common "O" antigen distinguished as XII. The antigen is serologically and immunochemically specific but occurs in different species. The "H" antigens are of similar specificity but of less broad occurrence. In general, it is wise to depend more on the presence of anti-H agglutinins than on anti-O agglutinins for purposes of differentiation (Gardner, A. D., and Stubbington, E. F.: *J. Hyg.* **32**:516, 1932).

LEAD POISONING FROM BITING FURNITURE

TO THE EDITOR:—*What is the incidence of lead poisoning in children from their biting furniture? What types of paint should be used for children's furniture? Are federal laws against the use of lead in paint sufficiently enforced so that, even though the manufacturer does not state that the dyes used are harmless, this can be taken for granted?*

Thomas P. Rumore, M.D., West Brentwood, L. I., N. Y.

ANSWER.—At present the incidence of lead poisoning among children from their gnawing on baseboards, furniture or toys is low. At present few coating materials for interiors and furniture contain lead, for economic reasons. Lithopone and titanium dioxide have largely replaced lead compounds. Some lead may appear in the pigments, such as the greens and oranges. No substantial toy manufacturer now uses lead paints. Synthetic dyes have widely displaced mineral pigments, although traces of lead may be present in quick-drying agents. No specific federal laws have been enacted with respect to lead in these paints. The matter chiefly has been solved on the basis of intelligent understanding and good faith on the part of manufacturers. Some difficulty still arises from the well meaning neighborhood friend of children who repaints old toys, using whatever paint is on hand. Some of the aniline dyes employed on toys are theoretically capable of inducing methemoglobinemia, but the quantity involved is less than in crayons.

VIRUS X DISEASE

TO THE EDITOR:—*Can you give me information about a condition known as virus X disease? Is there such a disease?*

Roy Truckenmiller, M.D., Freeland, Pa.

ANSWER.—The term virus X disease has been applied to a number of diseases of obscure or unknown etiology which have appeared to be infectious on clinical and epidemiological grounds. One of the most widely known of these was the Australian X disease, a seasonal encephalitis which appeared in Australia during the late summers of 1917, 1919, 1922, 1925 and 1926. This condition is now thought to have been closely related to Japanese B encephalitis. During the winter of 1947-1948, "virus X disease" was applied to an epidemic of a disease in California characterized by acute gastroenteritis in some patients and by influenza-like symptoms in others. Influenza A′ was later shown to have caused a considerable proportion of these cases. More recently the term virus X has been used loosely in connection with similar outbreaks in New York and elsewhere. Except for results of a few experiments suggesting a viral etiology, the causes of these outbreaks are still unknown.

RH INCOMPATIBILITY

TO THE EDITOR:—*I shall appreciate information concerning an Rh positive husband and an Rh negative wife in her first pregnancy. The woman has completed her fifth month of pregnancy without ill effects. All observations are normal. Should hapten therapy be instituted? The administration of estrogen seems unnecessary, since their efficacy could not be gaged.* *R. J. Kent, M.D., Savannah, N. Y.*

ANSWER.—The course of pregnancy does not permit conclusions as to possible complications from Rh incompatibility. Fetal erythroblastosis is rare in the first-born child, except when there is a history of a transfusion of Rh-positive blood given to an Rh-negative woman in the past, no matter how distant. A test for Rh antibodies near term may be of help prognostically. If it is found that antibodies will be present, compatible Rh-negative blood should be on hand at the delivery for transfusion for the newborn, but only if clinical signs of disease are manifest. Hapten has not been found useful prophylactically against fetal erythroblastosis (Wolf, A. M.; Schlutz, C.; Freundlich, M., and Levinson, S. O.: Clinical Study of Prevention of Erythroblastosis with Rh Hapten, *J. A. M. A.* **144:**88 [Sept. 9] 1950). The same is true of estrogen therapy.

CONGENITAL SYPHILIS

TO THE EDITOR:—*A 20 year old patient has a positive Kahn reaction, probably because of congenital syphilis, since her sister also has a positive reaction. She was given two series of penicillin injections of 10,000,000 units. She also received bismuth subsalicylate by intramuscular injection. The Kahn reaction continues to be positive. Is there any other treatment the patient should be given?*

J. B. Carlyle, M.D., Burlington, N. C.

ANSWER.—A positive Kahn reaction in a patient 20 years of age and in the patient's sister is not in itself sufficient evidence to warrant a diagnosis of congenital syphilis. Evidence of the disease in one or the other parent or the presence of stigmas of congenital syphilis is essential to such a diagnosis. Penicillin has not been effective in reversing the serologic reactions of young adults with congenital syphilis. Bismuth injections have also been ineffective. In other words, the serologic reactions in the tardive form of congenital syphilis are prone to remain positive for long periods of time, in spite of treatment. It is essential that this patient's cerebrospinal fluid be examined; if it is found to be normal and if the patient is asymptomatic and has no symptoms or manifestations of syphilis, a period of observation would be advisable, with reexamination of the patient at least once a year.

DIZZINESS FOLLOWING RECOVERY FROM TYPHUS

TO THE EDITOR:—*A man aged 45 had typhus last December that responded to chloramphenicol (chloromycetin®) therapy; however, he has had residual dizziness that consists of objects moving when he walks. Neurological examination, blood serology and spinal tap in April 1950 were negative. Roentgenograms show what is thought to be a definite osteosclerosis of the left petrous pyramid. On June 27, 1950, the patient was advised to continue a salt-free regimen. Please advise me as to diagnosis and therapy.*

Bernard Lahasky, M.D., Erath, La.

ANSWER.—This complaint suggests two possible explanations: 1. A disturbance of the vestibular mechanism. This is a characteristic complaint of patients who have suffered paralysis of the vestibular mechanism following streptomycin therapy. It might be caused by chloramphenicol therapy or by typhus. Examination of the vestibular responses on caloric stimulation, as well as an examination for ataxia by test of the patient's ability to walk on both an even and uneven or springy surface, such as a mattress, both with the eyes open and blindfolded, would provide evidence as to the possibility of a defect in the gait due to impairment of vestibular function. (See Glorig, A., and Fowler, E. P., Jr.: Tests for Labyrinthine Function Following Streptomycin Therapy, *Tr. Am. Oto. Soc., Inc.* **35:** 66, 1947; Northington, P.: Syndrome of Bilateral Vestibular Paralysis and Its Occurrence from Streptomycin Therapy, *Arch. Otolaryng.* **52:**380 [Sept.] 1950.)

A complaint of this type may be explained on the basis of a visual defect; for example, a refractive error or the wearing of bifocal glasses might lead to this complaint as a temporary symptom. If the residual dizziness should prove to be due to vestibular damage, complete compensation does not occur, but gradual improvement may be expected during the first six months to a year after the original illness.

RESPIRATORY INFECTIONS IN SCHOOL CHILDREN

TO THE EDITOR:—*There is a high incidence of upper respiratory infections among school children in this area. Discussion has arisen on the possibilities of using one of the glycols and/or ultraviolet lights. Which of these methods would be most effective? Can you estimate their approximate cost? Would you advise one of these methods as a means of combating this problem?* *Robert E. Smith, M.D., Parsons, W. Va.*

ANSWER.—Both ultraviolet radiation and various glycols have been studied to determine their effectiveness in reducing respiratory infections. In most studies there has been some reduction in the incidence of various respiratory diseases, but the results indicate that the general use of either ultraviolet radiation or glycol vapors in school rooms is not justified at the present time. Ultraviolet lights should not be employed without expert advice and consultation. Since continued supervision is required, this procedure is expensive. Glycol vapors may be employed, but their value is doubtful.

ABSCESSED TEETH

TO THE EDITOR:—*In "Queries and Minor Notes" in the December 2 issue of* THE JOURNAL *I read with interest the discussion on abscessed teeth. Treatment of acute infections about the jaws differs from treatment of similar infections elsewhere in the body in that the application of external heat tends to spread the infection along the lines of the fascial planes rather than aid in localization. The application of external heat to minor dental infections may in the course of a few hours produce immense swelling that would not have taken place without such treatment. In the absence of root canal fillings, the treatment of choice is the establishment of drainage by means of an opening, made with a dental bur, into the pulp chamber of the affected tooth. This treatment usually effects a remission of symptoms in the course of a few hours. If drainage is not established through the tooth, then treatment as described in your comment is indicated.*

The physician who attempts the medical management of acute dental infections should consult with competent dentists when he is faced with this problem. Apart from the benefit that might accrue to the patient, such consultation would promote better understanding between the medical and dental professions of what each can offer.

Paul H. Belding, D.D.S., Waucoma, Iowa.

"TUFTING" OF THE TERMINAL PHALANGES

TO THE EDITOR:—*To a query on conditions other than acromegaly in which tufting of the terminal phalanges appears* (THE JOURNAL, *Nov. 4, 1950) the answer was that "no other disease causes 'tufting.' It does not occur in pulmonary osteoarthropathy even though clubbing of the fingers may be conspicuous."*

I have found tufting of the terminal phalanges in hypertrophic pulmonary osteoarthropathy in patients with primary carcinoma of the lung. My observations were incorporated in chapter 8 of my monograph "Bronchiogenic Carcinoma and Adenoma" (Baltimore, Williams & Wilkins Co., 1948). Apparently there is no relation between tufting and clubbing, the latter being caused by changes in the soft parts of the terminal phalanges. Clubbing of terminal phalanges is occasionally a prominent feature in subacute bacterial endocarditis and bronchiectasis, although no tufting is present. *B. M. Fried, M.D., New York.*